Vol. 919 Number 2

OFFICIAL GAZETTE

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UNITED STATES PATENT OFFICE

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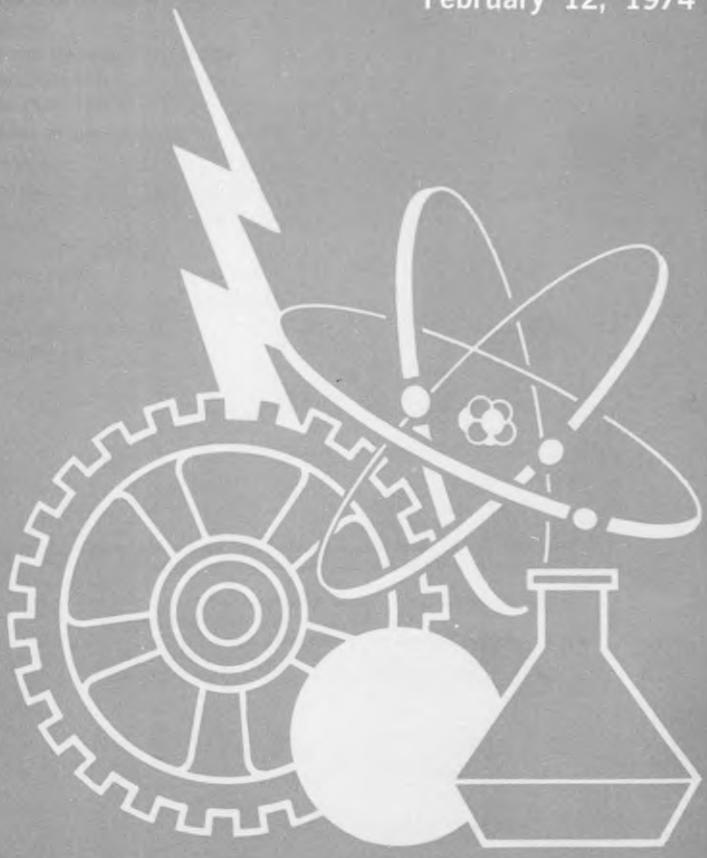
PATENTS

February 12, 1974



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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

February 12, 1974 Volume 919 Number 2

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PATENT NOTICES

Certificates of Correction for the Week of Feb. 12, 1974

P.P. 3,371	3,711,642	3,745,993	3,756,678
P.P. 3,380	3,713,711	3,746,575	3,758,080
Re. 27,732	3,717,640	3,746,649	3,758,322
D. 227,300	3,718,661	3,747,450	3,758,602
D. 228,040	3,720,653	3,747,515	3,758,821
D. 228,041	3,722,656	3,748,047	3,759,434
D. 228,297	3,723,480	3,748,201	3,760,093
3,492,710	3,725,226	3,750,139	3,760,112
3,515,645	3,725,525	3,750,607	3,760,686
3,529,344	3,725,950	3,750,916	3,760,988
3,559,274	3,726,888	3,751,195	3,762,256
3,580,655	3,727,488	3,751,465	3,762,356
3,602,129	3,727,760	3,751,522	3,763,153
3,622,596	3,728,402	3,751,593	3,763,177
3,643,184	3,728,527	3,752,165	3,763,416
3,651,277	3,728,592	3,752,751	3,763,576
3,651,282	3,729,370	3,752,951	3,763,817
3,653,196	3,731,955	3,752,967	3,763,900
3,663,159	3,732,242	3,753,391	3,764,364
3,669,366	3,732,332	3,753,984	3,764,559
3,681,602	3,732,647	3,754,409	3,764,715
3,690,062	3,733,697	3,754,436	3,764,841
3,693,335	3,734,056	3,754,527	3,764,928
3,695,003	3,735,531	3,754,958	3,765,474
3,695,824	3,736,122	3,755,365	3,767,685
3,701,250	3,737,632	3,755,614	3,767,736
3,705,024	3,737,665	3,755,893	3,769,013
3,708,558	3,745,099	3,756,201	
3,709,822	3,745,581	3,756,203	
3,711,525	3,745,945	3,756,597	

Dedication

3,626,290.—*Edward E. Aslan*, Plainview, N.Y. HIGH-FREQUENCY POWER MEASURING CIRCUIT EMPLOYING TWO SELF-BALANCING BRIDGES. Patent dated Dec. 7, 1971. Dedication filed June 6, 1973, by the assignee, *Hewlett-Packard Company*.

Hereby dedicates the entire remaining term of said patent to the Public.

Disclaimers

3,545,194.—*Robert W. Fish*, South Russell Village, Ohio, and *Wallace F. Stack*, Middletown Township, Bucks County, and *Craig J. Welch*, Ross Township, Allegheny County, Pa. REELING PREASSEMBLED PARALLEL WIRE STRANDS FOR BRIDGES AND OTHER STRUCTURAL APPLICATIONS. Patent dated Dec. 8, 1970. Disclaimer filed Dec. 17, 1973, by the assignee, *United States Steel Corporation*.

Hereby enters this disclaimer to claims 3, 4, 5 and 8 of said patent.

3,682,840.—*Paul R. Van Loan*, Grand Island, N.Y. ELECTRICAL RESISTOR CONTAINING LEAD RUTHENATE. Patent dated Aug. 8, 1972. Disclaimer filed June 28, 1973, by the assignee, *E. I. du Pont de Nemours and Company*.

Hereby enters this disclaimer to all claims of said patent.

3,706,552.—*John D. Grier*, Temperance, and *Maclin S. Hall*, Okemos, Mich. ELECTRODE CONFIGURATION FOR AC PIP ELECTROPHOTOGRAPHY. Patent dated Dec. 19, 1972. Disclaimer filed Sept. 18, 1972, by the assignee, *Owens-Illinois, Inc.*

The portion of the term of the patent subsequent to Oct. 24, 1989, has been disclaimed.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for licensing in accordance with the GSA Patent Licensing Regulations.

Copies of patent applications, either paper copy (PC) or microfiche (MF), can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22151, at the prices cited. Requests for copies of patent applications must include the patent application number and the title. Requests for licensing information should be directed to the address cited with each copy of the patent application.

Paper copies of patents cannot be purchased from NTIS but are available from the Commissioner of Patents, Washington, D.C. 20231, at $0.50 each. Requests for licensing information should be directed to the address cited below for each agency.

DOUGLAS J. CAMPION,
Patent Program Coordinator, National Technical Information Service.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C sts. NW., Washington, D.C. 20240

Patent application 386,792. Recovery of Rhenium. Filed Oct. 19, 1973. PC $3/MF $1.45.

Patent 3,634,199. Variable Orifice for Multistage Flash Evaporation or Distillation Units. Filed Apr. 20, 1970. Patented Jan. 11, 1972. Not available NTIS.

Patent 3,662,588. Determining Impurities in Helium. Filed Apr. 28, 1970. Patented May 16, 1972. Not available NTIS.

Patent 3,724,672. Asymmetric Hollow Fiber Membranes and Method of Fabrication. Filed July 27, 1970. Patented Apr. 3, 1973. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters, NASA—Code GP–2, Washington, D.C. 20546

Patent application 398,886. Reversed Cowl Flap Inlet Thrust Augmentor. Filed Sept. 17, 1973. PC $3/MF $1.45.

Patent application 393,528. A Dually Mode Locked Nd : YAG Laser. Filed Aug. 31, 1973. PC $3/MF $1.45.

Patent application 397,476. Structural Heat Pipe. Filed Sept. 14, 1973. PC $3/MF $1.45.

Patent application 397,478. Ophthalmic Liquefaction Pump. Filed Sept. 14, 1973. PC $3/MF $1.45.

Patent application 400,467. Dual Digital Video Switcher. Filed Sept. 25, 1973. PC $3.75/MF $1.45.

Patent application 402,866. Protection of Moisture Sensitive Optical Components. Filed Oct. 2, 1973. PC $3/MF $1.45.

Patent 3,262,025. Magnetic-Flux Pump. Patented July 19, 1966. Not available NTIS.

Patent 3,310,699. Ultrahigh Vacuum Gauge Having Two Collector Electrodes. Patented Mar. 21, 1967. Not available NTIS.

Patent 3,334,225. Quadrupole Mass Filter With Means To Generate a Noise Spectrum Exclusive of the Resonant Frequency of the Desired Ions to Deflect Stable Ions. Patented Aug. 1, 1967. Not available NTIS.

Patent 3,379,052. Soil Penetrometer. Patented Apr. 23, 1968. Not available NTIS.

Patent 3,748,722. Production of Hollow Components for Rolling Element Bearings by Diffusion Welding. Patented July 31, 1973. Not available NTIS.

Patent 3,751,727. Space Suit. Patented Aug. 14, 1973. Not available NTIS.

Patent 3,751,980. Low Power Electromagnetic Flowmeter Providing Accurate Zero Set. Patented Nov. 12, 1971. Not available NTIS.

Patent 3,754,976. Peen Plating. Patented Aug. 28, 1973. Not available NTIS.

Patent 3,755,283. Novel Polymers and Method of Preparing Same. Patented Aug. 28, 1973. Not available NTIS.

Patent 3,758,112. Foot Pedal Operated Fluid Type Exercising Device. Patented Sept. 11, 1973. Not available NTIS.

Patent 3,758,877. Power Supply for Carbon Dioxide Lasers. Patented Sept. 11, 1973. Not available NTIS.

Patent 3,759,249. Respiratory Analysis System and Method. Patented Sept. 18, 1973. Not available NTIS.

Patent 3,759,443. Thermal Flux Transfer System. Patented Sept. 18, 1973. Not available NTIS.

Patent 3,759,746. Porous Electrode Comprising a Bonded Stack of Pieces of Corrugated Metal Foil. Patented Sept. 18, 1973. Not available NTIS.

Patent 3,759,787. Nuclear Fuel Elements. Patented Sept. 18, 1973. Not available NTIS.

Patent 3,760,248. Induction Motor Control System With Voltage Controlled Oscillator Circuit. Patented Sept. 18, 1973. Not available NTIS.

Patent 3,760,268. Rocket Borne Instrument To Measure Electric Fields Inside Electrified Clouds. Patented Sept. 18, 1973. Not available NTIS.

Patent 3,763,552. Method of Fabricating a Twisted Composite Superconductor. Patented Oct. 9, 1973. Not available NTIS.

Patent 3,763,740. Collapsible Pistons. Patented Oct. 9, 1973. Not available NTIS.

Patent 3,764,220. Alignment Apparatus Using a Laser Having a Gravitationally Sensitive Cavity Reflector. Patented Oct. 9, 1973. Not available NTIS.

[FR Doc. 74-1806; Filed 1-22-74; 8:45 am]

National Technical Information Service

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Paper copies of patents cannot be purchased from NTIS but are available from the Commissioner of Patents, Washington, D.C. 20231, at $0.50 each. Requests for licensing information should be directed to the address cited below for each agency.

DOUGLAS J. CAMPION,
Patent Program Coordinator, National Technical Information Service.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

National Institutes of Health, Chief, Patent Branch, Westwood Building, Bethesda, Md. 20014

Patent 3,755,825. Artificial Heart Consisting of a Biventricular Pump With Control Mechanisms for Total Replacement of Human Heart. Filed May 18, 1972. Patented Sept. 4, 1973. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th and C Sts. NW., Washington, D.C. 20240

Patent 3,648,845. Thin Film Separation Membranes and Processes for Making Same. Filed Sept. 2, 1969. Patented Mar. 14, 1972. Not available NTIS.

DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research, Code 302, Arlington, Va. 22217

Patent 3,668,684. Portable Morse Code Signaling Device. Filed Dec. 28, 1970. Patented June 6, 1972. Not available NTIS.

Patent 3,669,912. Method of Making Deep Ocean Buoyant Material. Filed May 24, 1968. Patented June 13, 1972. Not available NTIS.

Patent 3,670,396. Method of Making a Circuit Assembly. Filed Apr. 12, 1971. Patented June 20, 1972. Not available NTIS.

Patent 3,670,518. Garment Cooling System. Filed Dec. 21, 1970. Patented June 20, 1972. Not available NTIS.

Patent 3,670,574. Force Gaging Gloves. Filed Apr. 7, 1971. Patented June 20, 1972. Not available NTIS.

Patent 3,670,716. Self-Heated Protective Garment. Filed Dec. 21, 1970. Patented June 20, 1972. Not available NTIS.

Patent 3,671,481. New Lubricating Grease Compositions. Filed Sept. 22, 1970. Patented June 20, 1972. Not available NTIS.

Patent 3,671,609. New Polymeric Compositions. Filed July 27, 1970. Patented June 20, 1972. Not available NTIS.

Patent 3,671,796. Plasma Arc Flash Source. Filed Jan. 27, 1971. Patented June 20, 1972. Not available NTIS.

Patent 3,671,848. Frequency Conversion With Josephson Junctions. Filed Aug. 27, 1971. Patented June 20, 1972. Not available NTIS.

Patent 3,671,867. Noise Suppression Arrangement for Communication Receivers. Filed Apr. 15, 1970. Patented June 20, 1972. Not available NTIS.

Patent 3,671,904. Pick-Off. Filed Jan. 22, 1971. Patented June 20, 1972. Not available NTIS.

Patent 3,671,965. Rapid Deployment Corner Reflector. Filed Apr. 3, 1970. Patented June 20, 1972. Not available NTIS.

Patent 3,672,717. Claw Arms With Swivel Plate. Filed Jan. 25, 1971. Patented June 27, 1972. Not available NTIS.

Patent 3,673,474. Means for Generating (a Source of) Surface and Bulk Elastic Waves. Filed Sept. 25, 1970. Patented June 27, 1972. Not available NTIS.

Patent 3,673,501. Control Logic for Linear Sequence Generators and Ring Counters. Filed Aug. 18, 1971. Patented June 27, 1972. Not available NTIS.

Patent 3,673,609. Protective Helmet. Filed Jan. 27, 1971. Patented July 4, 1972. Not available NTIS.

Patent 3,673,613. Variable Friction Knee Unit With an Improved Swing Phase Control of Artificial Legs. Filed Apr. 8, 1971. Patented July 4, 1972. Not available NTIS.

Patent 3,674,407. Extrusion Press and Barrel. Filed Nov. 16, 1970. Patented July 4, 1972. Not available NTIS.

Patent 3,674,648. Bacterial Lamp. Filed Feb. 1, 1971. Patented July 4, 1972. Not available NTIS.

Patent 3,674,702. Hydrogen Gas Generating Composition and Method for the Same. Filed Feb. 25, 1970. Patented July 4, 1972. Not available NTIS.

Patent 3,675,012. Cinefluorographic Holography. Filed Oct. 15, 1970. Patented July 4, 1972. Not available NTIS.

Patent 3,675,052. Field-Delineated Acoustic Wave Device. Filed Aug. 7, 1970. Patented July 4, 1972. Not available NTIS.

Patent 3,675,342. Fire Fighting Trainer. Filed Mar. 9, 1971. Patented July 11, 1972. Not available NTIS.

Patent 3,675,343. Fire Fighting and Control Simulator. Filed Apr. 26, 1971. Patented July 11, 1972. Not available NTIS.

Patent 3,676,359. Chemical Sea Surface Marker. Filed Oct. 14, 1970. Patented July 11, 1972. Not available NTIS.

Patent 3,676,699. Asynchronous Pulse Width Filter. Filed Sept. 13, 1971. Patented July 11, 1972. Not available NTIS.

Patent 3,676,716. Fast Switch Utilizing Hybrid Electron Beam-Semiconductor Devices. Filed May 19, 1971. Patented July 11, 1972. Not available NTIS.

Patent 3,676,792. Frequency Multiplexing AGC Amplifier. Filed June 9, 1970. Patented July 11, 1972. Not available NTIS.

Patent 3,677,082. Knotmeter for Small Craft. Filed Nov. 30, 1970. Patented July 18, 1972. Not available NTIS.

Patent 3,677,787. Method of Rehardening Encapsulating Compositions. Filed Oct. 21, 1970. Patented July 18, 1972. Not available NTIS.

Patent 3,678,388. Ground Station System for Retransmitting Satellite Facsimile Signals Over Digital Data Links. Filed Dec. 14, 1970. Patented July 18, 1972. Not available NTIS.

Patent 3,678,468. Digital Data Storage System. Filed Dec. 15, 1970. Patented July 18, 1972. Not available NTIS.

Patent 3,678,853. Quick Disconnect Explosive Connector Assembly. Filed June 12, 1970. Patented July 25, 1972. Not available NTIS.

Patent 3,679,215. Tape Recorder. Filed Feb. 3, 1967. Patented July 25, 1972. Not available NTIS.

Patent 3,679,394. Method for Casting High Ti Content Alloys. Filed Nov. 24, 1969. Patented July 25, 1972. Not available NTIS.

Patent 3,680,036. Electrical Connector. Filed Sept. 17, 1970. Patented July 25, 1972. Not available NTIS.

Patent 3,680,046. Alerting System. Filed Dec. 18, 1970. Patented July 25, 1972. Not available NTIS.

Patent 3,680,050. Serial Digital Pulse Phase Interface Driver and Receiver. Filed July 10, 1970. Patented July 25, 1972. Not available NTIS.

Patent 3,680,087. Scan Conversion Through Electroluminescent Storage Panels. Filed Oct. 20, 1970. Patented July 25, 1972. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters, NASA—Code GP-2, Washington, D.C. 20546

Patent 3,751,733. Tactile Sensing-Means for Prosthetic Limbs. Patented Aug. 14, 1973. Not available NTIS.

[FR Doc. 74-2310; filed 1-28-74; 8:45 am]

PATENT EXAMINING CORPS

WILLIAM FELDMAN, Acting Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 19, 1974

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-02-73
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-25-72
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	10-11-72
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. L. LEAVITT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	1-04-73
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	9-01-72
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	6-13-73
SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	9-18-72
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-02-73
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-16-72
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	2-02-73
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	4-11-72
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-16-73
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	2-26-73
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	3-02-73
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-22-73
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	9-28-72

Expiration of patents: The patents within the range of numbers indicated below expire during January 1974, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,775,762 to 2,779,941, inclusive
Plant Patents..... Numbers 1,543 to 1,558, inclusive

REISSUES

FEBRUARY 12, 1974

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

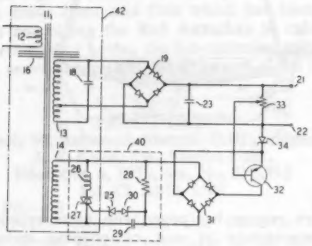
27,916

CLOSED LOOP FERRORESONANT VOLTAGE REGULATOR WHICH SIMULATES CORE SATURATION

Robert John Kakalec, Madison, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Original No. 3,525,035, dated Aug. 18, 1970, Ser. No. 763,881, Sept. 30, 1968. Application for reissue Dec. 6, 1971, Ser. No. 204,849

Int. Cl. G05f *1/38*; H02m *7/20*
U.S. Cl. 323—61 **10 Claims**



In a ferroresonant voltage regulator of either the two core or the one core type, the function of the saturating core is replaced by an integrating circuit, a switch, and and inductor. The integrating circuit is coupled to the normally saturating winding to develop an integrating capacitor voltage proportional to the volt-time integral of the ferrocapacitor voltage. The switch couples the inductor to the normally saturating winding in response to the voltage across the integrating capacitor to reverse the charge on the ferrocapacitor and provide ferroresonant type regulation without the disadvantages that accompany core saturation. A feedback network which varies the charging rate of the integrating capacitor in response to load voltage may be added to provide good closed loop regulation simply, inexpensively and efficiently.

27,917

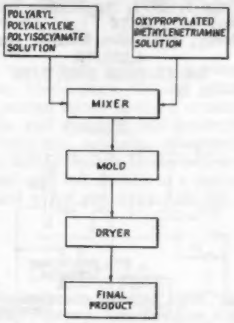
OPEN-PORE POLYURETHANE PRODUCT

Robert T. Jefferson, Columbus, Ind., and Ival O. Salyer, Dayton, Ohio, assignors to the United States of America as represented by the United States Atomic Energy Commission

Original No. 3,574,150, dated Apr. 6, 1971, Ser. No. 828,647, May 28, 1969, which is a continuation-in-part of abandoned application Ser. No. 586,923, Oct. 17, 1966. Application for reissue Oct. 1, 1971, Ser. No. 185,643

Int. Cl. C08g *22/12, 22/44*
U.S. Cl. 260—2.5 BD **7 Claims**

An open-pore polyurethane structure having a porosity of at least 50% and a density of 0.1–0.5 grams per cubic centimeter; and comprising coherent spherical particles of less than 10 microns diameter separated by interconnected interstices useful as a filter and oil-absorbent; and the method of producing said structure.



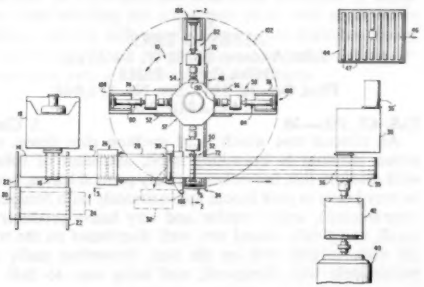
27,918

MULTIPLE-HEAD SLITTING APPARATUS

David M. Montguire, Elm Grove, Wis., assignor to National Steel Corporation

Original No. 3,513,743, dated May 26, 1970, Ser. No. 662,061, Aug. 21, 1967. Application for reissue May 23, 1972, Ser. No. 256,187

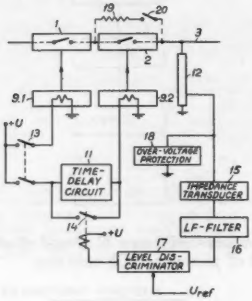
Int. Cl. B23d *19/06*; B26d *1/16*
U.S. Cl. 83—433 **22 Claims**



Slitting apparatus includes a plurality of slitter heads carried by a turntable. The turntable is mounted for rotation about a stationary column which carries a drive unit. While one slitter head is operated by the drive unit to slit material at a slitting station, the other slitter heads are at servicing stations. Rotation of the turntable positions any selected slitter head at the slitting station. A feed table and an entry pinch roll assembly are provided along a pass line to the slitting station. The feed table and pinch roll assembly are movable out of the path of rotation of

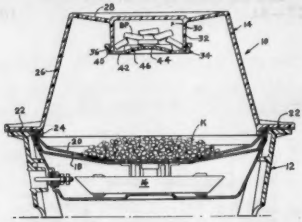
the turntable and slitter heads to avoid interference with rotation of the turntable. An aligning mechanism assures accurate alignment of a slitter head at the slitting station.

27,919
CIRCUIT BREAKER FOR HIGH VOLTAGE DIRECT CURRENT
Walter Pucher, Vasteras, Sweden, by Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden, assignee
Original No. 3,678,335, dated July 18, 1972, Ser. No. 148,711, June 1, 1971. Application for reissue Apr. 19, 1973, Ser. No. 352,718
Claims priority, application Sweden, June 15, 1970, 8,258/70
Int. Cl. H02h *3/00, 7/10*
U.S. Cl. 317—11 A **4 Claims**



In a switching device for HVDC comprising two series-connected breaker units, the operating release of the device comprises a time delay means controlled by the voltage of the HVDC network. When breaking at voltages above a certain level, one of the breaker units opens a predetermined time before the other one, thus reducing the switching over-voltage. Below said level, however, the breaker units open simultaneously.

27,920
POPCORN POPPER HAVING AUTOMATIC BUTTERING MEANS
Joseph E. Cole, Wellesley, Mass., assignor to Scovill Manufacturing Company, Waterbury, Conn.
Original No. 3,722,399, dated Mar. 27, 1973, Ser. No. 136,892, Apr. 23, 1971. Application for reissue Sept. 11, 1973, Ser. No. 394,281
Int. Cl. A23l *11/18*
U.S. Cl. 99—323.8 **4 Claims**



Popcorn popper has cover with butter-receiving support. Temperature at end of popping melts butter which passes through apertures in support to drip over popped corn.

PLANT PATENTS

GRANTED FEBRUARY 12, 1974

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,471
ALMOND TREE
John Andrew, 15760 W. 1st Ave., Delhi, Calif. 95315
Filed Oct. 20, 1971, Ser. No. 191,044
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—30 **1 Claim**

An almond tree which is of medium size, dense, vigorous, medium in branching habit, abundant of foliage with medium size, lanceolate, acutely pointed leaves, heavy to very heavy in pink bloom approximately with Nonpareil (unpatented), and a regular and very heavy producer of small, completely closed nuts well distributed on the tree; the nuts hanging well on the tree, harvesting easily approximately with Nonpareil, and being easy to hull.

3,472
MINIATURE ROSE PLANT
Ralph S. Moore, 2519 E. Nobel Ave., Visalia, Calif. 93277
Filed Apr. 17, 1972, Ser. No. 244,968
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, much branched, bush type, as illustrated and described, characterized by buds and flowers resembling the Toy Clown miniature rose (U.S. Plant Pat. No. 2,909) in general form but with a contrasting red and yellow color, the general color effect of the freshly opened flower being a bright red with some yellow or orange showing on the reverse or outer petal surfaces; and further characterized by a plant which is vigorous and compact in growth, easy to propagate from cuttings; with small medium green foliage, an abundance of bloom borne almost continuously throughout the growing season with flowers borne usually singly or in small loose clusters.

3,473
STRAWBERRY PLANT
Harold A Johnson, Jr., Watsonville, Calif., assignor to Driscoll Strawberry Associates, Inc., Watsonville, Calif.
Filed June 7, 1972, Ser. No. 260,693
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—49 **1 Claim**

1. The new and distinct variety of strawberry plant herein described and illustrated, and identified by the characteristics enumerated above.

3,474
BEGONIA PLANT
Bruno Bernstein, Bad Segeberg, Germany, assignor to Mikkelsens, Inc., Ashtabula, Ohio
Filed June 12, 1972, Ser. No. 262,087
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A unique and distinct cultivar of *Begonia elatior* characterized particularly by its short, compact, and full

growth; its soft light yellow flowers; its extreme ease of propagation from small leaf cuttings that develop a very high number of adventitious shoots, which phenomenon is of significant economic importance to the grower; its good resistance to powdery mildew and botrytus allowing the variety to be used in outdoor plantings; its capability of being produced for flowering crops on a year around basis by leaf propagation and controlled environmental conditions; and by its long lasting and long flowering qualities in the home when properly handled.

3,475
APPLE TREE
Bernard S. Jurale, 457 New Hanover Ave., South Meriden, Conn. 06450
Filed June 15, 1972, Ser. No. 263,274
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—34 **1 Claim**

1. A new and distinct variety of apple tree, substantially as herein shown and described, characterized particularly as to novelty by the distinctive flavor of the fruit, which is enhanced by its high pH and tartness and by its high sugar content, as well as by the unusual flavor the cider made from said fruit which has been frozen, said fruit resembling the Red Astrachan in color, form and tenderness, but having the late maturing and keeping qualities, as well as spicy taste and aroma of the Baldwin.

3,476
PEACH TREE
Frederic W. Anderson, Merced, Calif., assignor to L. E. Cooke Co., Visalia, Calif.
Filed Oct. 6, 1972, Ser. No. 295,595
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—43 **1 Claim**

A genetically dwarf peach tree which is vigorous, spreading, dense, foliated with large leaves having globose glands, and a regular and productive bearer of medium size, globose to slightly oblate, symmetrical, uniform, freestone fruit, having yellow skin partially overspread with red, yellow flesh, and a red pit cavity with the red streaked into the flesh.

3,477
NECTARINE TREE
Frederic W. Anderson, Merced, Calif., assignor to Stark Bro's Nurseries and Orchards Co., Louisiana, Mo.
Filed Oct. 6, 1972, Ser. No. 295,709
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—41 **1 Claim**

A nectarine tree which is large, vigorous, spreading, open, foliated with large to medium size lanceolate leaves having reniform glands, medium in blooming period with large, pink flowers, and a regular and productive bearer of large, globose, symmetrical, uniform fruit having orange-yellow skin substantially overspread with red shading to a deeper purplish-red, yellow flesh, and a red pit cavity with the red streaked into the flesh.

3,478
NECTARINE TREE
Frederic W. Anderson, Merced, Calif., assignor to Reedley Nursery, Inc., Reedley, Calif.
Filed Oct. 13, 1972, Ser. No. 297,378
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—41 **1 Claim**

A nectarine tree which is large, vigorous, upright to spreading, open, vase-formed, foliated with large lanceolate, acutely pointed leaves having a crenate margin and reniform glands, and a regular and productive bearer of large to medium size, uniform, symmetrical, globose, clingstone fruit having smooth, lemon-yellow skin substantially overspread with red shading to a deeper purple-red, yellow flesh, and a red pit cavity with the red streaked into the flesh.

3,479
PLUM TREE
Frederic W. Anderson, Merced, Calif., assignor to Reedley Nursery, Inc., Reedley, Calif.
Filed Oct. 13, 1972, Ser. No. 297,869
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—38 **1 Claim**

A plum tree which is of medium size, vigorous, spreading, open, round-topped, foliated with large obovate leaves, and a regular and very productive bearer of large, freestone, uniform, symmetrical, globose fruit having deep purple-red skin with a silver-blue bloom, buff-yellow flesh, and a light tan stone.

3,480
POINSETTIA PLANT
Jack S. Sweet, St. Petersburg, Fla., assignor to Earl J. Small Growers, Inc., Pinellas Park, Fla.
Filed Oct. 16, 1972, Ser. No. 298,436
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—86 **1 Claim**

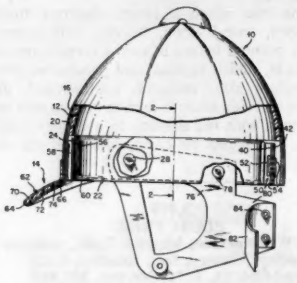
1. A new and distinct variety of poinsettia plant substantially as illustrated and described, produced by selective cross breeding for a compact plant with short internodes, a strong, stiff stem structure that branches freely from a single pinch to produce a compact multiple inflorescence with a massive display of bracts.

PATENTS

GRANTED FEBRUARY 12, 1974

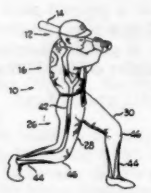
GENERAL AND MECHANICAL

3,790,962
HEAD PROTECTING HEADWEAR
Mario Plastino, 120 Talley Ln., Wantagh, N.Y.
Filed Jan. 7, 1972, Ser. No. 216,118
Int. Cl. A42b *3/00*
U.S. Cl. 2—3 R **11 Claims**



A peaked helmet in which the rigid outer shell is provided with an energy absorbing peak. The peak includes a stiff, crescent-shaped core formed of a close-grained, synthetic plastic sponge material, whose concave marginal edge portion is of reduced thickness and is bonded to a forwardly directed ledge extending from the front edge of the shelf by its reduced marginal edge portion.

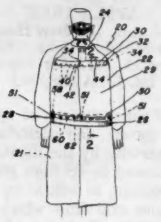
3,790,963
ONE PIECE GARMENT
Mary I. Ealy, Monee, Ill., assignor to Merry Jumpsuits
Filed Feb. 4, 1972, Ser. No. 223,675
Int. Cl. A41d *13/02*
U.S. Cl. 2—79 **1 Claim**



A play uniform comprising a one piece garment with enclosed feet characterized by the provision of visually distinct areas relating to the rules of activity of the game for which the garment is to be used.

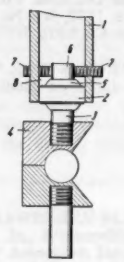
3,790,964
VENTED OPERATING ROOM GOWN
Edward G. Hartigan, Schaumburg, Ill., assignor to The Kendall Company, Walpole, Mass.
Filed Nov. 22, 1971, Ser. No. 200,961
Int. Cl. A41d *13/00*
U.S. Cl. 2—114 **7 Claims**

An improved operating room gown of the type which has a front and a back for covering the front and back portions of a user's body, and in which sterile fields are associated with the outside of the gown front and the outside of the gown back generally intermediate the shoulders and the waist of the



gown. The gown has means for ventilating the inside of the gown with air, while preventing contamination of the sterile fields from the ventilating air.

3,790,965
ANGLE ADJUSTMENT UNIT FOR PROSTHESES AND ORTHOSES
Franz Gelbenegger, Wulsdorfer weg 85, Hamburg-Volksdorf, Germany
Filed July 26, 1972, Ser. No. 275,434
Claims priority, application Germany, July 30, 1971, P 21 38 153.3
Int. Cl. A61f *1/08, 1/04*
U.S. Cl. 3—21 **3 Claims**



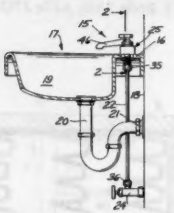
An angle adjustment unit for the angular positioning of a prosthesis or orthosis member with respect to a conventional prosthesis joint, comprising a commercial ball-and-socket joint coupled to the conventional prosthesis joint by means of a rod extending through the ball-and-socket joint and projecting at a free end portion into the prosthesis member. By means of screws threaded into the prosthesis member and engaging the free end portion of the rod the prosthesis member may be locked in any desired angular position with respect to the conventional prosthesis joint.

3,790,966

QUICK-CHANGE FAUCET

Joseph Keane, 6634 Villa Vista Dr., Riverside, Calif.

Filed Dec. 16, 1971, Ser. No. 208,749
Int. Cl. E03c *1/04, 1/042*
U.S. Cl. 4—192 10 Claims



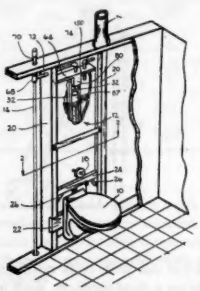
A quick-change faucet that can be attached to a sink, working entirely from above, except for attaching the riser pipes to the shut-off valves. The riser pipes are first attached to the hot and cold water valves before mounting the faucet on the sink, and the riser pipes are passed down through holes in the sink ledge which are big enough in diameter to pass the fittings. The bottom ends of the riser pipes are then connected to the shut-off valves. The water-mixing manifold, or cast faucet housing, has provision for passing mounting bolts downwardly through bolt-holes, and these bolts are screwed down into threaded bushings which are secured in openings in the sink ledge. The mounting bolts are turned down into the bushings from above the sink, instead of reaching up under the sink into the almost inaccessible area behind the basin.

3,790,967

WATER CLOSET

James M. Pignato, 5819 N. Artesian, Chicago, Ill.

Filed Nov. 1, 1971, Ser. No. 194,291
Int. Cl. E03d *3/00*
U.S. Cl. 4—28 12 Claims



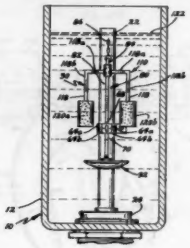
An improved water closet that can be positioned within a wall to conserve floor space and including a double-float valve system for closing the inlet and discharge ends of the tank. Also included is a means for overcoming the hydrostatic pressure to permit a floatation of the discharge float valve and anti-syphon means for use with the tank.

3,790,968

FLUSH VALVE DEVICE FOR TOILETS

Pius Pfeifer, 1751 100th St., North Battleford, Saskatchewan, Canada

Filed May 3, 1972, Ser. No. 249,882
Int. Cl. E03d *1/22, 1/30*
U.S. Cl. 4—38 13 Claims



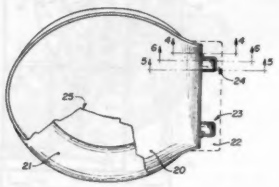
A pair of laterally spaced float members are supported on the lifting rod or valve stem at an adjusted or preferred elevation above a nonbuoyant and weighted valve member threadedly attached to the lower end of the rod or stem. The lower threaded end of the stem is angled at 7½° and the valve member has a threaded recess therein also angled at 7½°. Owing to the square cross section of the valve stem and a complementally configured guide affixed to the overflow pipe in the toilet tank, the valve member will operate in conjunction with either a flat or slanted valve seat. Smaller seats can also be accommodated by merely selecting an intermediate angular position of the valve member on the valve stem. An indicator pin on the stem and angularly disposed indicia in the form of small bumps enable the user to readily select the proper angular position of the valve member for the particular type of valve seat.

3,790,969

CONCEALED HINGE

Vernon L. Waldon, Crawfordsville, Ind., assignor to Ingress Manufacturing Co., Inc., Crawfordsville, Ind.

Filed Feb. 24, 1972, Ser. No. 229,012
Int. Cl. A47k *13/12*
U.S. Cl. 4—236 11 Claims



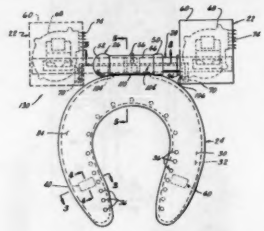
A concealed hinge for connecting a pair of members to a fixture. A pair of hinge posts are mounted to the fixture each having coaxially aligned and outwardly extending pins. One of the members is ring shaped and has a rear portion with an upwardly extending wall which cooperatively defines with a pair of flanges depending therefrom a recess for concealing the hinge posts. The pins of the hinge posts project freely through each flange of the member with the member being pivotable thereon. The other member is restable atop the one member and has a rear portion with a pair of socketed walls depending therefrom cooperatively defining a cavity into which the upwardly extending wall projects. The hinge posts are spaced inward of the flanges which are spaced inward of the pair of walls. The hinge pins project freely into the sockets provided in the pair of walls.

3,790,970

TOILET STOOL VENTILATING MEANS

David Bendersky, Overland Park, and Clarence E. Poister, Fairview, both of Kans., assignors to PK Products, Inc., Wichita, Kans.

Filed Nov. 15, 1971, Ser. No. 198,706
Int. Cl. E03d 9/04; A47k 13/12
U.S. Cl. 4—217 5 Claims



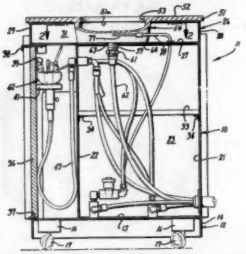
The seat of a toilet stool has an air chamber which receives odorized air. It is in communication with a passageway in the seat attaching hinge. The hinge passageway communicates with a filter wherein air is deodorized and passed into the atmosphere. Blower apparatus therein moves normally odorized air through filtering material. The seat hinge passageway and the filter are connected by a conduit. Pressure exerted on the seat activates the blower apparatus.

3,790,971

CUSPIDOR AND DENTAL CONSOLE FOR USE THEREWITH

Shirl S. Fox, Menlo Park, Calif., assignor to Dental Designs, Menlo Park and Palo Alto, Calif.

Filed Apr. 12, 1971, Ser. No. 132,980
Int. Cl. A61c 17/04
U.S. Cl. 4—263 6 Claims



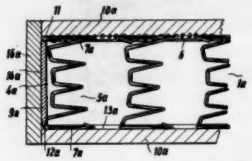
A cuspidor for use in a dental console in which the cuspidor is in the form of a bowl having an open top side in which the bowl has a bottom wall and an upwardly extending outwardly inclined annular side wall with a drain opening formed in the bottom wall to permit liquid to drain from the bowl and with an additional opening formed in the bowl which faces in a direction so that a liquid introduced through the additional opening will exit as a liquid stream striking the side wall in a generally tangential direction to cause the stream to swirl around the bowl before exiting through the drain opening.

3,790,972

SPRING CORE MATTRESS AND METHOD OF MAKING SAME

Walter Lehmann, Pleidelsheim, Germany, assignor to Mirabed AG, Zug, Switzerland

Division of Ser. No. 66,789, Aug. 25, 1970, abandoned. This application Feb. 29, 1972, Ser. No. 230,412
Claims priority, application Denmark, Mar. 18, 1970, 1349/70
Int. Cl. B68g 7/00; A47c 27/22
U.S. Cl. 5—351 26 Claims



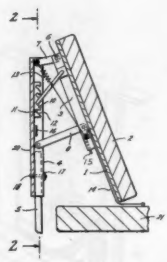
A spring core mattress and method of making the same, according to which a spring core composed of a pluarity of coil springs has end portions of the end coils of said springs embedded at least partially in cover plates which are substantially parallel to each other while said coil springs are under a preload, cover means surrounding peripheral portions of said coil springs while said cover means and said cover plates are surrounded by foamed-out material and are held thereby in their respective relative positions.

3,790,973

ADJUSTABLE PIVOTAL HEADBOARD

William J. Bradley, P.O. Box 20203, Houston, Tex.

Filed Dec. 22, 1971, Ser. No. 210,851
Int. Cl. A47c 17/00, 21/00
U.S. Cl. 5—53 B 7 Claims



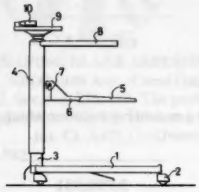
A headboard for use with beds consisting of a supporting means montable on a rigid medium, such as a bed frame, or a wall, or other suitable anchoring means, to permit tilting of the headboard and anchoring same at the desired position, with the headboard pivoting at one end and the other end traveling on a plane substantially parallel with the horizontal plane of the bed, the bar pivotally anchoring the headboard also acting as a stabilizing means, and the anchoring means being of novel structure to permit positive maintainance of the headboard at the desired position and novel means being provided to adjust the supporting means vertically.

3,790,974

LIFTING AND TRANSPORTING DEVICE FOR DISABLED PERSONS

Hans Arne Valentin Johansson, Treharadsvagen 40, Esloy, Sweden

Filed June 30, 1972, Ser. No. 267,903
Claims priority, application Sweden, July 8, 1971, 8828/71; Oct. 7, 1971, 12687/71; Mar. 10, 1972, 3056/72
Int. Cl. A61g 7/10
U.S. Cl. 5—86 14 Claims



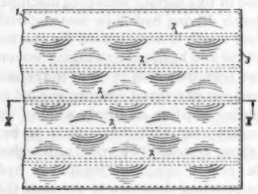
A device for lifting and transporting disabled persons comprising a wheeled base rack on which a first upright support column is fixed while a second support column is movable on the first column. The second column carries arm rests and a seat which is mounted pivotably and releasably.

3,790,975

AIR MATTRESS

Werner Philipp, Bry-sur-Marne; Andre Thomas, Briant-Amilly, and Basile Fetissof, Pannes, all of France, assignors to Etablissements Hutchinson Compagnie Nationale, Loiret, France

Filed Mar. 15, 1971, Ser. No. 124,363
Claims priority, application France, Mar. 18, 1970, 7009644; Sept. 22, 1970, 7034285
Int. Cl. A47c 27/08
U.S. Cl. 5—349 6 Claims



An air mattress includes two covers each with a series of longitudinally extending fabric strips secured to the respective inner faces. Opposite corresponding strips are interconnected by partitions which may be continuous with spaced apertures or may be discontinuous.

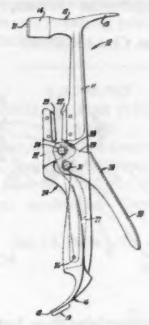
3,790,976

CARPET LAYING TOOL CONSTRUCTION

John Stencil, 1115 Eye St., Modesto, Calif.

Filed Mar. 10, 1972, Ser. No. 233,417
Int. Cl. B25f 1/00; B26b 13/22
U.S. Cl. 7—8.1 R 2 Claims

A carpet laying tool includes a tack strip cutter disposed intermediate the ends of an elongate handle while the opposite ends of the handle carry elements which serve to space the cutter from a support surface against which they both can be urged while pressing against the handle and clamping the cutter grip to the handle so as to permit application of substantial force against the grip of the cutter. Preferably, the spacing elements on each end of the handle include on one end a claw for removing baseboard from walls and, on the other hand, a hammer head of conventional construction.

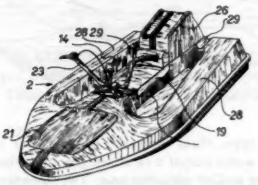


3,790,977

HULL CONSTRUCTION FOR WATERCRAFT

Alphonse R. Bombardier; Gerard Bombardier, both of Valcourt, and Germain Bombardier, St. Mathias, Rouville County, Quebec, all of Canada, assignors to Germain Bombardier, by said Alphonse Bombardier and Gerard Bombardier, St. Mathias, Quebec, Canada

Filed Jan. 24, 1972, Ser. No. 220,140
Int. Cl. B63b 5/00
U.S. Cl. 9—6 4 Claims



A hull for a watercraft, and in particular for a sport boat, adapted to ally both stability and instability without sacrificing or opposing one to the other; this being achieved by forming a transverse bottom outline which combines typical rounded and substantially planar bottom portions transversely adjacent each other, with the planar outline portions extending on opposite sides of the rounded portion lengthwise of the hull, elevated relative to the rounded portion and forming inflections therewith and longitudinally thereof. The planar outline portions are arranged to provide dynamic sustentation upon impact thereon of waves produced by the suitably shaped bow portion. The hull further includes a top deck forming section defining longitudinally reinforcing wall portions, footrest depressions on opposite sides of a central longitudinal seat supporting boss, and a trench-like depression extending lengthwise of the hull to recess the control links therein.

3,790,978

METHOD AND APPARATUS FOR MAKING LASTS

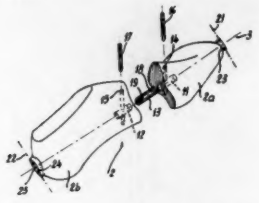
Armand Eloi Condamine, Sainte Foy Les Lyon, and Rene Jean Jacques Philippe Rigal, Lyon, both of France, assignors to Centre Technique Du Cuir, Lyon, France

Filed June 19, 1972, Ser. No. 264,283

Claims priority, application France, June 18, 1971, 71.23387

Int. Cl. A43b *00/00*

U.S. Cl. 12—146 L 20 Claims



This method of manufacturing shoe lasts made of several detachable elements, i.e., a basic standardized element and at least one interchangeable element dependent upon fashion, consists in marking the trace of the turning axis on the ends and on each joint plane of the model elements and of the lasts deriving therefrom, and using said trace for laying out means for the relative connection and positioning of said interchangeable elements and of said standardized elements of the model and of said lasts.

3,790,979

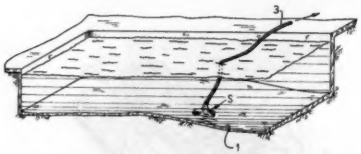
SUBMARINE TYPE, SELF-PROPELLED SUCTION SWEEPER

Douglas E. Foster, Racine, Wis., assignor to Wm. Didier Mfg. Co., Racine, Wis.

Filed Nov. 6, 1972, Ser. No. 304,018

Int. Cl. E04h *3/20*

U.S. Cl. 15—1.7 14 Claims



A suction type, fluid operated sweeper for sweeping and pumping the water out of a swimming pool or the like and to a water filtering and/or cleaning unit. The sweeper moves along the bottom of the pool and a suction hose extends upwardly therefrom to draw water through the sweeper for depositing it in the water cleaning unit outside of the pool. The water passing through the sweeper, due to the action of the suction, is utilized to drive the propelling means for the sweeper to cause the sweeper to ambulate along the bottom of the pool.

3,790,980

MOTOR DRIVEN BRUSH

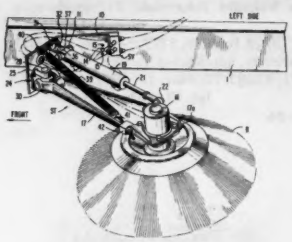
F. Arthur Sylvie, East Elmhurst, N.Y., assignor to Arthur J. Sylvie, Jamaica, N.Y.

Division of Ser. No. 192,125, Oct. 26, 1971, abandoned. This application June 22, 1972, Ser. No. 265,109

Int. Cl. A46b *13/02*

U.S. Cl. 15—23 1 Claim

A portable, hand-held, power-driven rotary brush having at least one rotary brush mounted thereon which is driven by an electrical motor coupled to the brush by a pulley-belt, or gearing system. The motor housing and the rotary brushes are



detachable from a mounting member which supports the gearing and pulley system.

3,790,981

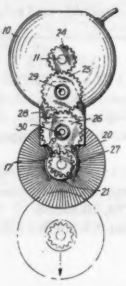
SURFACE SWEEPING MACHINE EQUIPPED WITH GUTTER BRUSH

Bernard W. Young, deceased, late of P.O. Box 2368, Waco, Tex. (by Sophie Young, executrix)

Filed Sept. 15, 1972, Ser. No. 289,453

Int. Cl. E01h *1/04*

U.S. Cl. 15—87 29 Claims



A mobile road or like surface sweeping machine has a gutter brush and a brush driving hydraulic motor carried on a supporting structure which is mounted on the machine frame for compound vertical and horizontal swinging movements from a stowed position, with the brush in close to the machine frame and elevated and out of contact with the ground surface, to an extended operating position relatively wide of the frame and in pressure engagement with the surface to be swept. The brush rotates about a generally vertical although slightly tilted axis. A single power operated means, a hydraulic ram, operates the supporting structure to produce the compound vertical and horizontal swinging of the latter. When the brush encounters increased resistance to rotation, for example due to built-up or heavy debris, the pressure of the hydraulic fluid at the motor inlet increases, and the ram responds to that condition by forcing the brush into greater pressure contact with the surface, thereby ensuring greater capability of sweeping the obstruction.

3,790,982

SCRAPING BLADE

Jack W. Whitsett, 936 Castile Ave., Coral Gables, Fla.

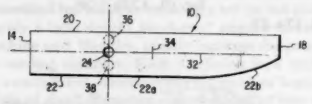
Filed May 4, 1972, Ser. No. 250,189

Int. Cl. A47l *13/02*

U.S. Cl. 15—236 NO 5 Claims

A scraping blade for use in a power operated rotary scraping device wherein the blade is formed of a generally flat sheet

of material having a lower edge of finite thickness which provides the scraping edge. An aperture is formed through the



blade with between 60 percent and about 80 percent of the length of the blade being disposed to one side of the center of the aperture.

3,790,983

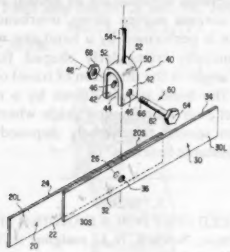
SCRAPING BLADE ASSEMBLY

Jack W. Whitsett, 936 Castile Ave., Coral Gables, Fla.

Filed May 4, 1972, Ser. No. 250, 188. The portion of the term of this patent subsequent to May 16, 1999, has been disclaimed.

Int. Cl. A47l *13/02*

U.S. Cl. 15—236 NO **7 Claims**



A scraping blade assembly includes a pair of elongated scraping blade members and a blade supporting and mounting means having a pair of walls with a space therebetween. The blades are mounted within the space and a transverse bar member extends through apertures in the walls and the blades to loosely mount the blades within the space. The apertures in the blades are offset from the midpoint thereof so that the blades will gravitationally tilt under their own weight, to assume a position wherein a dihedral angle is formed between the scraping edges of the adjacent blades.

3,790,984

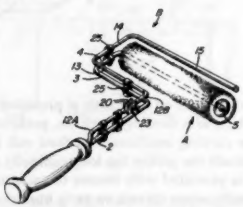
GUARD FOR PAINT APPLICATOR

Brower C. Spransy, 4516 Rynex Dr., Alexandria, Va.; Norman G. Harper, 2100 Shad Ct., Naples, Fla., and Joseph Clayton Steele, 3817 Bightview St., Silver Spring, Md.

Filed Sept. 22, 1972, Ser. No. 291,240

Int. Cl. A46b *17/00*

U.S. Cl. 15—248 A **1 Claim**



A quickly-detachable and rod-like guard is provided which simulates in size and shape the rod-like portions of the conventional paint-applying roller and is adapted to fully overlie the smae in spaced parallelism when in operative position and provide an elongated substantially straight guard member which extends in spaced parallelism with said roller; a hinged joint being provided whereby the aforementioned substantially straight and elongated guard member may be elevated into and out of operative position; the entire rod-like guard being supported in said overlying position by the use of a plurality of rod-embracing clips.

3,790,985

WIPER ARRANGEMENT FOR WINDSHIELDS AND THE LIKE

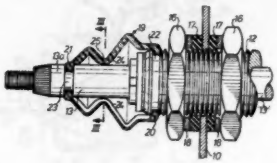
Peter-Jurgen Kessler, Buhlertal, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed June 12, 1972, Ser. No. 261,937

Claims priority, application Germany, July 2, 1971, 2133077

Int. Cl. B60s *1/18, 1/04*

U.S. Cl. 15—250.34 **11 Claims**



A bushing is to be mounted in a wall of the vehicle, and the wiper assembly is journalled in the bushing for oscillatory rotation. The assembly includes an arm which carries a wiper blade, and which is in turn mounted on a shaft journalled in the bushing. A sealing device is provided to prevent the entry of contaminants at the axial end of the bushing from which the shaft extends to the arm. The sealing device is in form of a sleeve of elastomeric or similar material with one end of the sleeve surrounding the axial end of the bushing and being connected therewith, and the other end surrounding the shaft and being connected with the latter in the region of the arm, or with the hub of the arm itself, in such a manner that the sleeve will tend to follow the rotation of the shaft and flex in response to such rotation.

3,790,986

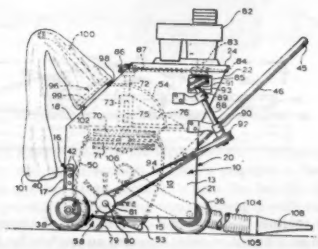
DEBRIS PICKUP AND COLLECTION APPARATUS

Edward Burger, 3535 Fawn Cove, Memphis, Tenn.

Filed Jan. 3, 1972, Ser. No. 214,832

Int. Cl. A47l *5/28*

U.S. Cl. 15—328 **11 Claims**



A mobile mechanical raking apparatus for gathering, shredding and loading into a receptacle scattered debris both on lawns and paved surfaces or selectively from less accessible places such as around bushes or roof gutters.

The apparatus normally sucks the debris upwardly from the ground through an upper opening into a receptacle. The apparatus may be converted into a stationary stacker by reversing the drive and feeding debris through the upper opening, the debris being shredded and sucked downwardly and discharged through the hose, which in normal operation is a suction hose, into a stack.

3,790,987

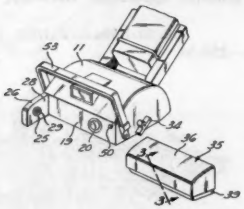
DRIVE MEANS FOR VACUUM CLEANER

Charles H. MacFarland, Rocky River, Ohio, assignor to The Scott & Fetzer Company, Cleveland, Ohio

Filed Oct. 20, 1972, Ser. No. 299,345

Int. Cl. A47l *5/30*

U.S. Cl. 15—392 **6 Claims**



A vacuum cleaner having a motor housing to which powered attachments may be directly mechanically coupled without the use of drive belts as the mechanical coupling between the motor housing and the powered attachment. The motor housing encloses a motor fan unit and a drive belt which couples the motor to a drive socket. The drive socket extends through a wall in the housing so that the socket may receive the drive shafts of powered attachments, such as vacuum cleaner brush nozzles, power polishers, rug scrubbers, and power-driven miscellaneous tools. A vacuum inlet extends through the wall in the motor housing and suction hoses may be attached to the inlet for off-the-floor cleaning purposes.

3,790,988

ANCHOR FOR HOLDING A FISH WHILE WORKING ON THE SAME

Neil J. Maxwell, 138 S. Gina Ave., El Cajon, Calif.

Continuation-in-part of Ser. No. 42,820, June 2, 1970, which is a continuation-in-part of Ser. No. 761,227, Sept. 20, 1968, abandoned. This application May 22, 1972, Ser. No. 255,724

Int. Cl. A22c *25/00*

U.S. Cl. 17—70 **11 Claims**

A fish retainer comprising a combination of a support for a fish such as a board or table top and an anchor for yieldingly holding the fish on the top surface of the support when it is desirable to skin, fillet or scale the fish. The anchor includes a stem which extends rearwardly through the mouth of the fish and the free end of the stem abuts the rear wall of the stomach cavity of the fish. The stem forces the fish against the support.

3,790,989

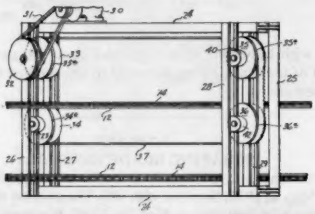
CARCASS SPLITTING MACHINE

Septime R. Hotard, 390 N.W. Bay St., Ponchatoula, La.

Filed June 27, 1972, Ser. No. 266,635

Int. Cl. A22b *5/20*

U.S. Cl. 17—23 **15 Claims**



A device is described for splitting an animal carcass vertically while the carcass moves along overhead rails. The splitting operation is performed by a band saw which is supported on a generally triangularly shaped frame and is disposed at a 45° angle to the direction of travel of the carcass along the rails. The band saw is driven by a motor which causes it to travel over four flanged guide wheels which are mounted between spaced transversely disposed I-beams on self-centering adjustable bearings.

3,790,990

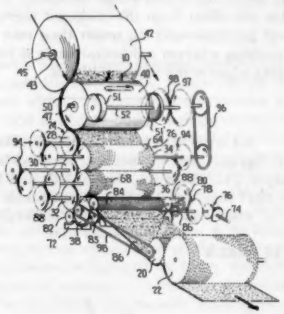
REFINING FEED UNIT FOR A CARDING MACHINE

Maurice A. Goldman, Newark, N.J., assignor to Synagex Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 879,886, Nov. 25, 1969, Pat. No. 3,657,772. This application Apr. 25, 1972, Ser. No. 247,467

Int. Cl. D01g *15/40*

U.S. Cl. 19—105 **1 Claim**



A horizontally disposed feed unit is provided for feeding a picker lap or batt to a carding machine, preferably a refining feed unit type carding machine The feed roll in its rotation about its axis leads the picker lap longitudinally to the carding machine and is provided with means to reciprocate the feed roll longitudinally along its axis so as to impart a herringbone pattern to the picker lap as it is fed to the carding machine, which herringbone pattern imparted to the fibers of the picker lap as they are fed to the carding machine slants every fiber across the teeth of the carding roll to which it is fed and, thus,

assists in closing up any bores or holes or pin spots in the picker lap. Advantageously, the picker lap to which a herringbone pattern has been imparted to the fibers thereof, is fed to a card feed unit which is positioned at a carding machine in place of a standard lap stand to refiningly act on the picker lap so as to supply a light-weight blanket of aligned fibers to the carding machine and, thereby, greatly increase the production rate of the carding machine. Such a refining feed unit would comprise a two-column, plane-supported stack of horizontally disposed rolls of small diameter with the rolls of one column being in nested relationship with the rolls of the companion column in the rolls from the feed roller, which imparts a herringbone pattern to the fibers in the lap, to the blanket delivering bottom of the unit at an increased number of spirally arranged teeth and are driven at increased speeds so that each roll performs in two drafting stages. It drafts from the upper preceding roll and holds against the lower succeeding roll.

3,790,991

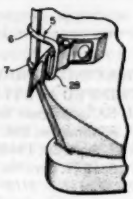
CABLE CLOSURE ASSEMBLY

Alden B. Hanson, and Chris A. Hanson, both of Boulder, Colo., assignors to Hanson Industries Inc., Boulder, Colo.

Filed July 10, 1972, Ser. No. 269,946

Int. Cl. A43c *11/14*

U.S. Cl. 24—70 SK **9 Claims**



A cable closure for a boot including two flexible members which are connected to each other by means of substantially rigid tubular end members into which the flexible members are inserted and retained.

3,790,992

PROFILED CLOSING MEMBERS WITH SLIDE

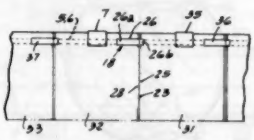
Andre Herz, Nesles la Vallee, France, assignor to Minigrip, Inc., Orangeburg, N.Y.

Filed June 19, 1972, Ser. No. 263,792

Claims priority, application France, June 30, 1971, 7123942

Int. Cl. A44b *19/24*; B65d *33/24*

U.S. Cl. 24—201 C **10 Claims**



A method of making bags and the bags resulting therefrom wherein the bags have a top edge and first and second side edges and interlocking rib and groove element at the top edge with a slider straddling the top edge and the slider having a back and downwardly projecting sides with the sides being closer together at a closing end of the slider which extends toward the first edge of the bag and being wider apart at the opening end of the slider which extends toward the second edge of the bag and with a finger between the sides at the opening end and the bag having heat seals joining the rib and groove elements and the heat seal being wider at the first edge than the second edge and being of a width at least equal to the length of the slider from its closing end to the finger so that the slider will remain fully on the bag at the end of its travel when opening the bag.

3,790,993

SLIDER-TYPE ASSEMBLY DEVICE

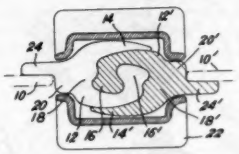
Roger Gilles, Lons, Pau, and Francis Nougarede, La Celle-Saint-Cloud, both of France, assignors to Entreprise De Recherches Et D'Activites Petrolieres (ELF), Paris, France

Filed May 25, 1971, Ser. No. 146,722

Claims priority, application France, May 28, 1970, 7019505

Int. Cl. A44b *19/10*

U.S. Cl. 24—201 C **6 Claims**



An assembly device comprising two identical forkshaped strips each having two arms and formed of elastically deformable materiel and a slider for opening and closing said device. The first arm is in the form of a tongue and the second arm has at least one terminal bead and one recess for receiving the terminal bead of the other strip. The second arm of each strip is clamped between the tongue and the second arm of the other strip in the interlocking position.

3,790,994

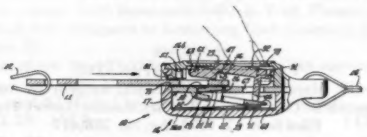
PUSH BUTTON BUCKLE

Hans Jakob, Sherman Oaks, Calif., assignor to American Safety Equipment Corporation, New York, N.Y.

Filed May 15, 1972, Ser. No. 253,168

Int. Cl. A44b *11/26*

U.S. Cl. 24—230 A **18 Claims**



A safety strap buckle of the type wherein a tongue plate attached to one strap section matingly engages a buckle attached to another strap section, where the buckle disclosed herein is provided by non-structural housing fixedly carrying a through-load member and including a push button operated latch assembly for selectively coupling tension loads between the through-load member and the tongue plate. The through-load member in addition to carrying the tension loads is provided with tongue plate guide and restraint means for bearing transverse loads on the buckle such that the housing itself serves merely as an encapsulating member. Assembly of the

buckle is facilitated by a two part construction of the encapsulating housing, including a base part having a cavity therein for receiving a load member and the latch member including a push button actuator maybe carried by such load member in a unidirectional assembly operation which is completed by mounting a cover part of the housing to the base part.

3,790,995

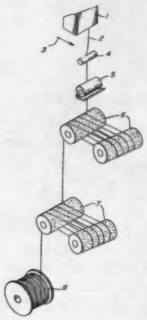
APPARATUS FOR THE PREPARATION OF POLYETHYLENE TEREPHTHALATE FILAMENTS

Horst G. Martin, Cham; Bernhard Glutz, Muenchenstein, and Hans Linz, Kriens, all of Switzerland, assignors to Societe de La Viscose Suisse, Emmenbrucke, Switzerland

Division of Ser. No. 28,821, April 15, 1970, Pat. No. 3,715,421. This application Apr. 11, 1972, Ser. No. 242,984

Int. Cl. D02j *1/22*

U.S. Cl. 28—59.5 **7 Claims**



A continuous spin-draw process is disclosed for preparing highly-drawn polyethylene terephthalate filaments drawn at speeds greater than 1,800 meters per minute using only one heated draw roll system without the use of any other heating device. Feed and draw rolls are provided with a surface roughness which allows a slipping of the filaments along a number of turns before they leave the feed rolls and after they arrive at the draw rolls. The filaments are partially drawn at the lower temperature of the feed rolls, drawing continues between the feed and draw rolls, and is completed at the higher temperature of the draw rolls with a total draw ratio between 5 and 8.

3,790,996

YARN GUIDING APPARATUS

Andre M. Marchand, Roanne, France, assignor to Ateliers Roannais De Constructions Textiles, Roanne (Loire), France

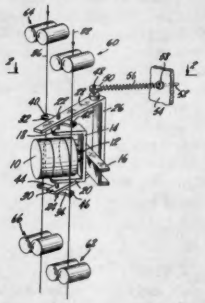
Filed Sept. 12, 1972, Ser. No. 288,417

Claims priority, application France, Sept. 23, 1971, 71.34349

Int. Cl. D02j *1/22*

U.S. Cl. 28—71.3 **19 Claims**

In the particular embodiments disclosed, apparatus for guiding two yarns over a curved surface is combined with a yarn drawing machine including feed rollers, take-up rollers and an intermediate cylindrical stretching element, thereby permitting two yarns to be drawn at the same drawing station. One or a pair of guide arms, each having a guide opening for a yarn at either end, are arranged relative to the cylindrical element to pass the yarns over the element in two spaced planes. The arms and the cylindrical element are pivotable one relative to the other to shift, e.g., interchange, the loci of the yarns on the element. In one embodiment, the guide arms are pivoted while the cylindrical element is held stationary, and in another the cylindrical element is pivoted while the arms remain fixed. Where a pair of guide arms are used, they may



be placed on opposite sides of the cylindrical element to guide the yarns in their approach to and departure from the cylindrical element.

3,790,997

PROCESS OF PRODUCING RANDOM THREE-DIMENSIONAL CRIMPED ACRYLIC FIBERS

Ronald A. Hagell, Lugoff, S.C., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 761,160, Sept. 20, 1968, abandoned. This application July 15, 1971, Ser. No. 163,037

Int. Cl. D02g *1/20, 1/12*

U.S. Cl. 28—72.11 **3 Claims**

Acrylic homocomponent fiber having random three-dimensional crimp is prepared by stuffer-box crimping tow under hot-wet conditions, cooling the crimped tow and then crimping the tow again under hot-wet conditions. These fibers, in staple form are especially suited for use in preparing improved sliver knit pile fabrics.

3,790,998

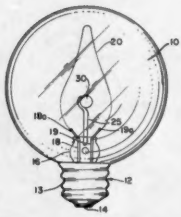
METHOD OF MAKING A LAMP WITH OSCILLATING FILAMENT

Rudolph Kaufman, Bronxville, N.Y., and Wolfgang E. Thouret, Verona, N.J., assignors to Duro-Test Corporation, North Bergen, N.J.

Filed Nov. 3, 1971, Ser. No. 195,350

Int. Cl. H01j *9/18, 9/42*

U.S. Cl. 29—25.13 **3 Claims**



A method is disclosed for selecting the proper filament length in an incandescent lamp designed for operation from a source of alternating current of a given frequency, the lamp

having a magnet producing a magnetic field which reacts with the current through the filament to cause the filament to oscillate. The length of the filament is selected in accordance with the frequency of the operating current to enhance the probability of the filament oscillating.

3,790,999

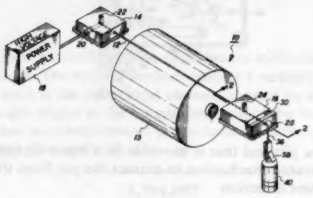
CORONA WIRE APPARATUS

Charles F. Gallo, Jr., Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 5, 1972, Ser. No. 295,414

Int. Cl. H01j *9/18*

U.S. Cl. 29—25.15 **13 Claims**



In electrophotographic apparatus wherein electrostatic charges are provided by corona wire apparatus, an improved corona wire end support block and terminating method in which a corona wire is secured and high voltage shielded internally in a plastic end block. The corona wire extends through a small internal linear bore through the block under a plastic set screw, and then through the lower end of a cut-off access notch, to outside tensioning means such as adjustable weights. The corona wire end is readily cut-off through the access notch so that both the terminated wire end and the fastening are fully inside the block. Thus, the potential for sparking or corona from exposed wire ends or other conductors is greatly reduced. Neither the securing or cut-off of the wire disturbes the desired tension on the wire. Further insulation may be placed in the notch after wire cut-off.

3,791,000

METHOD AND APPARATUS FOR SMOOTH-ROLLING OF CYLINDRICAL WORKPIECE SURFACES

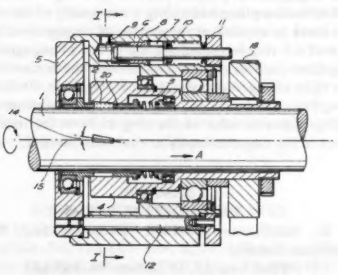
Bernhard Kunze, Erkelenz, Germany, assignor to Wilhelm Hegenscheidt Kommanditgesellschaft, Erkelenz, Germany

Filed Oct. 12, 1972, Ser. No. 296,893

Claims priority, application Germany, Oct. 13, 1971, 2150895

Int. Cl. B21c *37/30*

U.S. Cl. 29—90 R **7 Claims**



A tool is provided, having an annulus of rollers which are inclined to the axis of the annulus and which engage the cylindrical surface of a workpiece located cocentrically with respect to the annulus. The inclination of the rollers, which are rotated with reference to the workpiece and which engage the surface thereof over a drop-shaped area inclined to the axis of the annulus, tends to impart to the workpiece a thrust in one axial direction, and the workpiece is forcibly advanced in the opposite direction against this thrust.

3,791,001

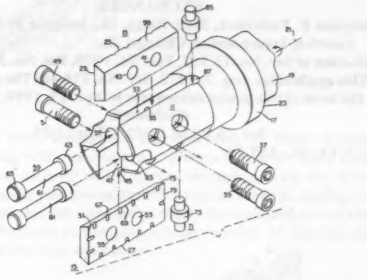
TOOL HOLDER WITH PROVISIONS FOR ACCURATELY POSITIONING CUTTING INSERTS AND AN IMPROVED CHIP BREAKING INDEXIBLE INSERT

John T. Bennett, 47 Paper Mill Ln., Newtown Square, Bucks, Pa.

Division of Ser. No. 19,023, March 12, 1970, Pat. No. 3,688,367. This application Aug. 31, 1972, Ser. No. 285,121

Int. Cl. B26d *1/00, 1/12*

U.S. Cl. 29—95 R **2 Claims**



A tool holder having at least one cutting insert (blade) receiving slot that is formed in part by a pair of spools at adjacent small side areas of the slot. The spools are held at a finite angle with each other which matches the angle between adjacent edges of a blade to be inserted in the slot. The spools provide a ridge to contact blade edge surfaces for only a small portion of their width. An application of this blade positioning technique is a multiple indexible blade rotary tool holder. Indexible blades for use in a wide variety of tool holders have improved chip breaking grooves adjacent to its cutting edges in surfaces thereof which lead into the work piece.

3,791,002

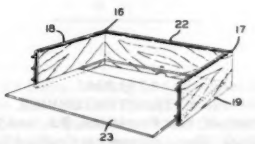
METHOD OF MAKING A THERMOPLASTIC DRAWER

John G. Lampe, High Point, and Willie E. Wall, Thomasville, both of N.C., assignors to Armstrong Cork Company, Lancaster, Pa.

Division of Ser. No. 127,258, March 23, 1971. This application July 31, 1972, Ser. No. 276,688

Int. Cl. B23p *17/00*; B23q *17/00*; B23k *31/02*

U.S. Cl. 29—155 R **1 Claim**



A drawer structure is made by the following described method steps. The rear and side panels of a drawer are formed from a single slab of foamed rigid poly(vinyl chloride) having

a reinforcing densified core and a densified outer skin with a wood grain pattern thereon. A longitudinal groove is formed in one surface of the slab adjacent the bottom edge thereof, and two V-shaped grooves are cut across the width of the same surface at appropriate ultimate corner forming locations. Appropriate guide slots and drawer front fastening configurations are formed on the slab. The slab is heated and bent at the V-shaped groove locations to form the rear and side panels of the drawer. A drawer bottom panel is installed in the longitudinal groove adjacent the bottom edge of the rear and side panels and the drawer front is attached. The drawer looks, feels, sounds, and handles like wood, but is less expensive and has many desirable qualities not possessed by wood.

3,791,003

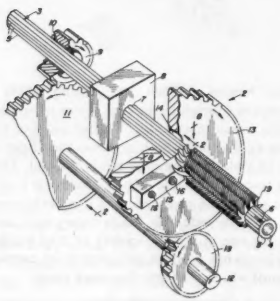
METHOD OF FRABRICATING A PLURAL FINNED HEAT EXCHANGER

Stephen F. Pasternak, Park Ridge, Ill., assignor to Peerless of America, Incorporated, Chicago, Ill.

Division of Ser. No. 13,297, Feb. 24, 1970, Pat. No. 3,727,682. This application Aug. 7, 1972, Ser. No. 278,401 The portion of the term of this patent subsequent to Apr. 17, 1990, has been disclaimed.

Int. Cl. B21d *53/02*; **B23p** *15/26*

U.S. Cl. 29—157.3 B **9 Claims**



A tubular heat exchanger having spine-type fins formed integrally from the wall thereof and disposed therearound, with the fins cut from ribs extending longitudinally of the heat exchanger, and a method of manufacture which includes rotary movement between a tool and an elongated, ribbed tubular member relative to the longitudinal axis of the latter.

3,791,004

PIN EXTRACTING DEVICE

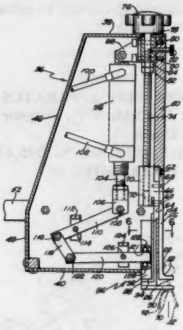
Thomas J. Crafford, East Providence, R.I., and John W. Crafford, Rehoboth, Mass., assignors to Crafford Tool & Die Co., Riverside, R.I.

Filed Sept. 25, 1972, Ser. No. 292,122

Int. Cl. B23p *19/00*

U.S. Cl. 29—200 D **8 Claims**

A device for extracting a headed pin from frictional engagement with a rod, wherein the rod is formed as part of an article holding rack. The device includes a holder member on which the rod is received and an extractor member that engages the



head of the pin and that is movable in a linear direction by a power operated mechanism to extract the pin from the rod in a straight line direction.

3,791,005

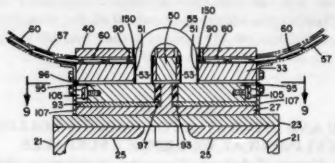
APPARATUS FOR ATTACHING SOLDER RINGS TO WORK PIECES

Ross Moyer, Tully, and Fred Karandy, East Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 166,792, July 28, 1971, Pat. No. 3,745,644. This application Apr. 23, 1973, Ser. No. 353,854

Int. Cl. B23p *19/00*

U.S. Cl. 29—200 B **7 Claims**



By the method and apparatus herein disclosed, solder rings, formed of solder material capable of taking a permanent set upon deformation, are fixed on work pieces for subsequent soldering to other work pieces. The perimeter of a solder ring, positioned at a predetermined location on a work piece, is engaged at two points spaced apart less than 180°. The solder ring is engaged by projections on forming blades or jaws moved toward a plane extending transversely of the ring. Sufficient force is applied at the points of engagement to bow a portion of the ring intermediate the points of engagement outwardly from the work piece and to draw the remainder of the ring in tight engagement about the work piece. Preferably the forming blades are each provided with a pair of projections for engaging opposite sides of the ring to bow the intermediate portions of the ring outwardly at each side thereof.

3,791,006

BALL JOINT PULLER

Paul E. Robinson, 107-1301 Rothesay St., Winnipeg, Manitoba, Canada

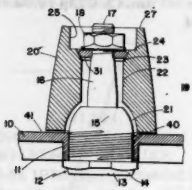
Filed Aug. 23, 1972, Ser. No. 283,157

Int. Cl. B23p *19/04*

U.S. Cl. 29—201 **9 Claims**

A cylindrical cone element is placed over the ball joint aperture and the ball joint assembly is offered up into the aperture

from the underside. One or more of a variety of adaptors is then placed over the screw fitted shank of the ball joint assembly and rests upon the conical surface of the cylindrical cone element whereupon a nut can be engaged with the screw fitted shank and tightened down upon the adaptor thus pulling



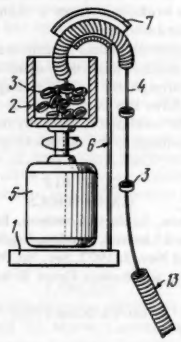
the ball joint assembly up into engagement within the walls of the aperture. The conical surface enables a straight pull to be exerted even if the cylindrical element cannot be aligned exactly at right angles to the longitudinal axis of the ball joint assembly due to constructional characteristics of the arm carrying the ball joint assembly.

3,791,007

DEVICE FOR PUTTING TOROIDAL FERRITE CORE ON WIRE

Yury Emelyanovich Seleznev, Vesenney proezd, 4a, kv. 16, and Yury Alexandrovich Burkin, Tsvetnoi procezd, 29, kv. 24, both of Novosibirsk, U.S.S.R.

Filed Sept. 27, 1972, Ser. No. 292,838
Int. Cl. H05k *13/04*
U.S. Cl. 29—203 MM **5 Claims**



A device for putting toroidal ferrite cores on a wire, in which the end of the wire is made at least as a half-turn of a spiral and is lowered into a magazine containing ferrite cores charged therein in bulk and constituting a layer. The magazine is rotated in the direction opposite to that of the winding of the spiral, with the device being provided with a fixing means for preventing the spiral from turning about the base of the device. This fact provides an automatic process of putting ferrite cores of any size on a wire of any diameter.

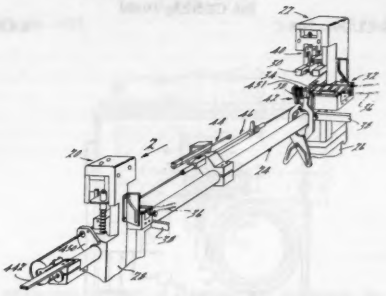
3,791,008

WIRE PROCESSING APPARATUS

Robert M. Dyksterhouse, RR 3, Charlevoix, Mich.

Division of Ser. No. 195,165, Nov. 3, 1971, Pat. No. 3,742,564.
This application Dec. 26, 1972, Ser. No. 318,102
Int. Cl. H01r *43/04*
U.S. Cl. 29—203 P **31 Claims**

The present invention relates to an improved wire processing apparatus for making electric wire leads and harnesses including the cutting of the wire or wires, the cutting and stripping of the insulation from the end portions thereof, and the assembly of the components including the connection of the terminals thereto. The apparatus includes spaced head mechanisms each including wire cutting and insulation cutting and stripping means, and terminal securing means, and which



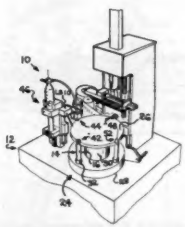
holds the wire throughout the operation of these means. Cooperating with the head mechanisms is one or more wire feed means each of which moves through one of the head mechanisms to position and end portion of a wire in another of the head mechanisms and then returns through said one of the head mechanisms to position another portion of the wire in said one of the head mechanisms.

3,791,009

APPARATUS FOR FILLING, LABELING, AND CLOSING CONTAINERS, SUCH AS SYRINGES

Larry C. Gess, 1255 Fir Dr., Toledo, Ohio

Filed Feb. 24, 1972, Ser. No. 228,917
Int. Cl. 53 *341*; B65b *3/00*
U.S. Cl. 29—208 B **12 Claims**



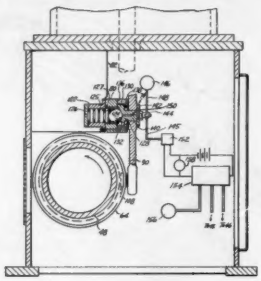
Apparatus for filling, labeling, and closing or applying needle assemblies to medicinal syringes is provided. The apparatus includes an adjustable pump for filling individual syringe barrel assemblies automatically with a predetermined amount of liquid. The barrels are then labeled with appropriate indicia showing the contents, with the labels printed immediately before to assure that the correct labels are applied to the proper syringes. Needle assemblies are crimped on the syringe barrels during labeling to complete the overall operation.

3,791,010

OVERLOAD MECHANISM FOR CAM OPERATED LINKAGES IN A MULTISTATION ASSEMBLY MACHINE

James T. Graham, Sterling Heights, and Fred W. Hackstock, Birmingham, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 204,755, Dec. 3, 1971, Pat. No. 3,724,052.
Filed Feb. 16, 1973, Ser. No. 333,436
Int. Cl. B23p 19/04
U.S. Cl. 29—208 C 6 Claims



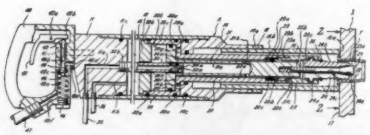
A station for an automatic nonsynchronous multistation assembly machine operated by a cam shaft extending transversely to the line of movement of the parts in the transport system, and featuring an individual overload mechanisms for each of the associated cam. The overload mechanism including a detent link pivot together with an associated drive disconnect and sensor system so that an overload condition causes displacement of the pivot link generating a sensor signal and a consequent disconnect of the drive system in response to the sensed signal.

3,791,011

TUBE PULLING DEVICE

Joe H. Keys, 315 N. Yupon St., Clute, Tex.

Continuation-in-part of Ser. No. 88,721, Nov. 20, 1970, abandoned. This application Apr. 24, 1972, Ser. No. 246,771
Int. Cl. B23p 19/04
U.S. Cl. 29—252 6 Claims



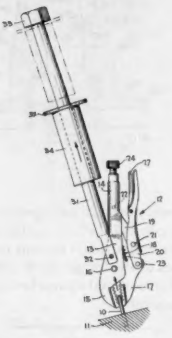
A tube pulling device for gripping and removing a tube, or tube end from a plate or tube sheet of a heat exchanger or the like, wherein a pair of pistons are arranged so as to coact with each other for movement in response to hydraulic fluid pressure for initially engaging a tube gripping means in the bore of the tube to be pulled and for thereafter exerting a pulling force on the tube relative to the plate or tube sheet in which the end of the tube is secured. The pistons are controlled without the use of one-way valves inside of the device and with the full hydraulic force applied to the pistons successively as required. The hydraulic fluid is supplied to the pistons from an external hydraulic system which is controlled by an air stream having a control at the device for manipulation by the operator.

3,791,012

TRACTION APPLYING TOOL

Arthur S. Jenkin, Peapack, N.J., assignor to Komline-Sanderson Engineering Corporation, Peapack, N.J.

Filed May 8, 1972, Ser. No. 251,425
Int. Cl. B23p 19/04
U.S. Cl. 29—254 1 Claim



A workpiece to which traction is to be applied is firmly held by a gripping device to which is anchored one end of a rectilinear guide having a free end directed away from the workpiece. An impact member of high inertia is slidably disposed on the guide for rapid movement toward an impacting engagement with an abutment carried by the guide adjacent its free end, whereby the resulting tensional forces in the form of a sudden impulse are transmitted through the gripping device to the workpiece for use, for instance, in withdrawing the workpiece from a member in which it is firmly anchored or embedded.

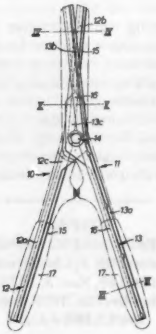
The impulse applying means is combined with the gripping device in such a manner to avoid transmitting the impulses to the workpiece through the toggle linkage or other locking means which secures the jaws of the device in gripping engagement with the workpiece, whereby to avoid loosening of the jaws and/or damage to the said locking means.

3,791,013

HAND TOOLS

Edward A. Rogers, Ashford Common, England, assignor to Wilkinson Sword Limited, London, England

Filed Nov. 3, 1972, Ser. No. 303,349
Claims priority, application Great Britain, Nov. 10, 1971, 52,127/71
Int. Cl. B26b 13/00
U.S. Cl. 30—254 4 Claims



In each of the illustrated hand tools, each blade is secured to a tang in the form of a strip of carbon steel, the whole tank

being sheathed in plastics material to form the shank and handle. In one embodiment each blade is formed by a strip of carbon steel integral with the tang, and on which a blade edge has been formed, the width of the strip in the blade being, in general, less than that of a conventional blade but having a backing of plastics material molded along the strip to make up its width.

3,791,014

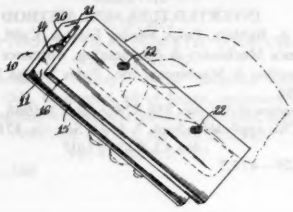
HAND CUTTING TOOL FOR GYPSUM PLASTER BOARDS OR THE LIKE

Anthony Perna, 118-01 101st Ave., Richmond Hill, N.Y.

Filed May 22, 1972, Ser. No. 255,813

Int. Cl. B26b *27/00*

U.S. Cl. 30—294 **3 Claims**



A hand cutting tool for recessing edges of gypsum plaster or wall boards and the like to facilitate attaching and minimizing beading and ridging at the butt joints therebetween when applied to a wall comprising an elongated body having an engaging groove for insertion of the edge of a board, a saw blade projecting from the base of the groove and running parallel with and spaced from one of the inner walls of the groove whereby a cut directly beneath the paper covering of the board may be made of preselected thickness and depth. The cutting tool effectively is a rabbet saw especially designed for rabbeting edges of plaster, gypsum or similar type boards.

3,791,015

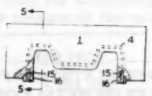
METHOD OF REPAIRING A BEAM BLANK MOLD

Gary S. Lucenti, Sault Ste. Marie, Canada, assignor to The Algoma Steel Corporation, Limited, Sault Ste. Marie, Canada

Filed Oct. 17, 1972, Ser. No. 298,441

Int. Cl. B23p *7/00*

U.S. Cl. 29—401 **4 Claims**



A method of repairing the worn joint in a mold particularly a beam blank mold formed of two halves by machining the worn joint to a recess of predetermined shape of selected dimensions and mechanically attaching preferably pinning a copper containing strip in said recess to have a precise fit therein and to form a substantially continuous surface in said mold.

3,791,016

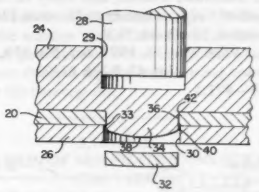
METHOD OF CREATING MOTION-FREE CONNECTION

George J. Eberhardt, Dayton, Ohio, and Gilbert Kennedy, deceased, late of Dayton, Ohio (by Dorothy L. Kennedy, executrix), assignors to The National Cash Register Company, Dayton, Ohio

Continuation-in-part of Ser. No. 812,777, April 2, 1969, abandoned. This application Oct. 22, 1971, Ser. No. 191,593

Int. Cl. B23p *11/00*

U.S. Cl. 29—432 **13 Claims**



A single-step method of creating, and apparatus for so creating, a motion-free connection of two members by reason of partially piercing one member wherein material from the one member is forced into and through the second member. The material being displaced from the one member creates an opening in the second member by removing a slug therefrom, and the displaced material assumes a shape to fill the opening, a portion of the material forced into and through the second member being flared outwardly, by reason of spring action in clamping around the portion, and thus form a mechanical bond to secure the two members. The connection provides complete bonding, by shearless flow of material, to resist separation of one member from the other, as well as torsional resistance to rotation between the two members.

3,791,017

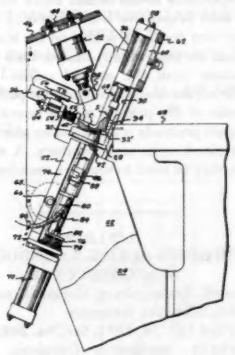
METHOD FOR SECURING DOOR FRAME COMPONENTS

Roy E. Smith, Atlanta, Ga., assignor to Textron Inc., Providence, R.I.

Division of Ser. No. 102,035, Dec. 28, 1970, Pat. No. 3,672,554. This application Feb. 1, 1972, Ser. No. 222,534

Int. Cl. B23p *11/00*

U.S. Cl. 29—432 **3 Claims**



Apparatus is provided for securing a door frame casing piece to a side jamb rapidly and effectively. The apparatus operates to hold the casing piece and side jamb in door frame relation while causing the side jamb to be toenailed to the cas-

ing piece and the casing piece to be square nailed to the side jamb. The nailing is done by respective fastener forming and inserting means, at least one of which is uniquely arranged to actuate feeding of a fastener length of wire stock, forming of a fastener from the fed length, and insertion of the formed fastener, from the working stroke of a reciprocating plunger.

3,791,018

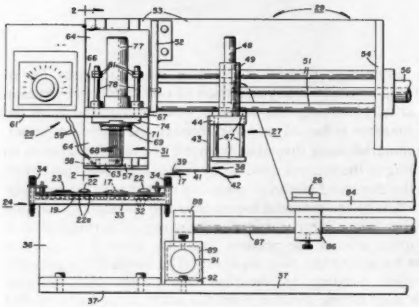
HEATING METHOD AND APPARATUS FOR SECURING A MEMBER TO AN ARTICLE

Walter K. Johnston, Denver, and Gary G. Seaman, Broomfield, both of Colo., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Nov. 16, 1971, Ser. No. 199,260

Int. Cl. B23k *31/02*

U.S. Cl. 29—471.1 **15 Claims**



Resilient leads of an integrated circuit module are reflow soldered to circuit paths on one side of a printed wiring board having component leads protruding from its opposite side. Apparatus for accomplishing the reflow soldering includes a plurality of vertically movable metal pins, one for each lead, and a heater block which is maintained at a constant temperature. When the pins are in upper positions, lower end portions thereof are disposed in apertures in the heater block, whereby discrete quantities of heat flow from the heater block into the lower end portions. The pins then are moved downward through the apertures in the heater block so that their lower ends engage their respective leads, whereby the heat in their lower end portions melts the solder on the leads momentarily. The pins, which are individually biased, then hold the leads in bonding position until the melted solder has cooled and solidified to bond the leads to the circuit paths. Uniform support of the side of the printed wiring board from which the component leads protrude is achieved by placing it on a bed of loosely constrained, spherical members. A modified from of the apparatus may be used to secure a member to an article by staking.

3,791,019

METHOD OF SOLDERING A CONDUCTOR TO A SEMICONDUCTOR

Gunther Schmidt, Ludwigsburg, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

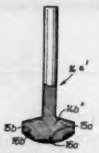
Filed Apr. 28, 1972, Ser. No. 248,520

Claims priority, application Germany, May 5, 1971, 2122104

Int. Cl. B23k *31/02*

U.S. Cl. 20—473.1 **2 Claims**

A semi-conductor element is to be connected with one or more conductor members by soft-soldering. The conductor member is formed with a nose-like projection having circumferential surface portions and a free end face which is planar and with which the circumferential surface portions define arcuate angles. Liquid solder is flow-deposited on the surface



portions and on the end face to form a solder-coating on them, particularly on the surface portions, and thereupon the coated endface is abutted against the semi-conductor element and soldered thereto.

3,791,020

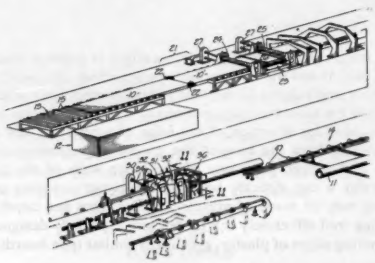
INVERTED TUBE MILL METHOD

Charles A. Babbitt, Palos Verdes Estates, Calif., assignor to Torrance Machinery & Engineering, Torrance and Babbitt Engineering & Machinery, Inc., Palos Verdes Estates, both of, Calif.

Continuation of Ser. No. 758,978, Sept. 11, 1968, abandoned. This application Sept. 7, 1971, Ser. No. 178,472

Int. Cl. B23k *31/02*

U.S. Cl. 29—477.7 **5 Claims**



A plurality of metal sheets disposed on a roller conveyor in end-to-end relation are tack welded to form a continuous sheet. The continuous sheet is passed through a series of forming rolls by which it is progressively formed into a tube with abutting side edges lying in a straight line along the underside of the tube. These side edges are seam welded on the inside of the tube, after which the individual sheets (now in tube form) are separated from one another and removed from the conveyor. Each tube is again seam welded, this time along the outside of the tube.

3,791,021

METHOD FOR INSTALLATION OF PLASTIC CLOSURE RECEIVER ON METAL CONTAINER

George F. Bauman, Auburn, Ind., assignor to Ricke Corporation, Auburn, Ind.

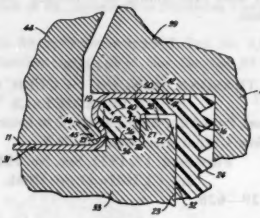
Division of Ser. No. 25,031, April 2, 1970, abandoned. This application Apr. 13, 1972, Ser. No. 243,703

Int. Cl. B21d *39/00*; **B23p** *11/00*

U.S. Cl. 29—510 **4 Claims**

A plastic receiver is internally threaded for reception of a plug. The receiver is provided with a radially extending flange with a downwardly opening channel on the underside thereof, an interior cylindrical wall of the channel serving as a back up face for a back up ring of an installation die, precluding col-

lapse of the flange upon die forming of a retaining pocket of a metal container member upon flange installation. Circularly spaced irregularities provided on the upper outer surface of



the flange effect matching deformations of the metal during installation, precluding subsequent rotation of the flange in the metal.

3,791,022

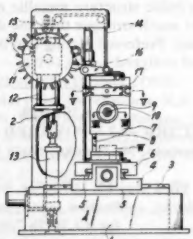
MACHINE TOOL WITH AUTOMATIC TOOL CHANGING APPARATUS

Mikishi Kurimoto, Nagoya; Syoji Inagaki, Kariya, and Noriyasu Oda, Gamagori, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

Filed Feb. 2, 1972, Ser. No. 222,915

Int. Cl. B23q *3/157*

U.S. Cl. 29—568 **9 Claims**



In a machine tool with an automatic tool changing apparatus, a spindle is provided which includes a projection at one end thereof and a drawing device therein for clamping the tool thereon. A tool magazine is provided for storing diverse tools, each of the diverse tools having a projection at the periphery thereof, and a tool transfer means is provided for transferring tools between the spindle and the tool magazine. Control means are provided for rotating the spindle through at least one revolution when a succeeding tool is inserted into the spindle by the tool transfer means, so as to abut the projection of the spindle on the projection of the tool, and for causing the drawing device to clamp the succeeding tool on the spindle after completing the rotation of the spindle through its one round.

3,791,023

METHOD OF MANUFACTURING A FIELD EFFECT TRANSISTOR

Werner Scherber, Heilbronn, Germany, assignor to Licentia Patent-Verwaltungs GmbH, Frankfurt am Main, Germany

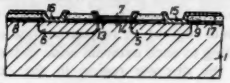
Filed Dec. 10, 1971, Ser. No. 206,635

Claims priority, application Germany, Dec. 21, 1970, 2061810

Int. Cl. B01j *17/00*

U.S. Cl. 29—571 **10 Claims**

A method of manufacturing a field effect transistor comprises forming a nitride layer on the surface of a semiconductor body of a first type of conductivity containing two spaced regions of a second type of conductivity; forming an oxide layer on the nitride layer; forming windows in the nitride and oxide layers extending to the surface of the semiconductor body above the two regions of the second type of conductivity



and above the zone between the two regions; forming a thin oxide layer in the window above the zone between the two regions; forming a gate control electrode in the window above the zone between the two regions and forming contacts in the windows above the two regions.

3,791,024

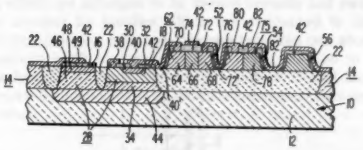
FABRICATION OF MONOLITHIC INTEGRATED CIRCUITS

Edward Joseph Boleky, III, Cranbury, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 21, 1971, Ser. No. 191,455

Int. Cl. B01j *17/00*

U.S. Cl. 29—577 **8 Claims**



A portion of a layer of monocrystalline silicon on a substrate is completely oxidized through to provide islands of silicon spaced apart by the portion of silicon dioxide. Spaced apart, thin layers of semiconductor material are provided on the silicon dioxide portion. Different semiconductor components are provided within the semiconductor islands and within the thin semiconductor layers. Preferably, the upper surfaces of the silicon islands and the silicon dioxide isolating portions are substantially coplanar, and connectors for the various components are disposed on these surfaces.

3,791,025

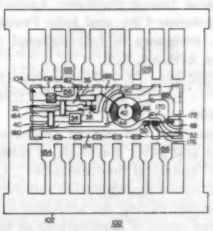
METHOD OF MANUFACTURING AN ELECTRONIC ASSEMBLY

Ciro Guarjado, Harbor City, Calif., assignor to Teledyne, Inc., Los Angeles, Calif.

Filed Apr. 6, 1972, Ser. No. 241,537

Int. Cl. B01j *17/00*

U.S. Cl. 29—577 **3 Claims**



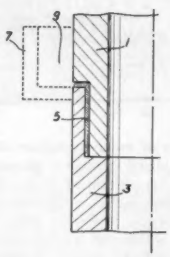
A method of manufacturing and packaging an electrical circuit formed from discrete components is disclosed in which

the final package is a dual in-line package. The components are mounted on a lead frame which includes an external support frame, a central portion including a plurality of discrete regions each corresponding to a respective one of the nodes in the circuit, and a plurality of leg members extending from the central portion to the support frame. Each of the discrete regions has no contact within the central portion with any of the other discrete regions. A respective one of the leg members corresponding to each external node in the circuit and is connected to the discrete region in the central portion corresponding to its external node. A body of insulative material is then formed around the central portion of the lead frame and the components, and the excess external portions of the lead frame are then removed.

3,791,026
METHOD OF JOINING A NIOBIUM TUBE TO A STAINLESS STEEL TUBE

Jean-Louis Dufrene, Aix-en-Provence; Jean Lacoste, Palaiseau; Robert Schley, Orly, and Jean Tortel, Chatillon-sous-Bagneux, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Claims priority, application France, Mar. 19, 1971, 71.09823
Filed Mar. 15, 1972, Ser. No. 234,805
Int. Cl. B23k *31/02*
U.S. Cl. 29—479 **2 Claims**



The method consists in fitting the end portions of the tubes one inside the other with a predetermined clearance, the steel tube being placed on the outside and provided at its extremity with an external machined annular flange forming a reservoir, in filling the reservoir with a suitable brazing compound, in placing the assembly in a vacuum and heating it to a temperature of 1,020° to 1,030°C and in removing the reservoir after the brazing operation.

3,791,027
SOLDERING METHOD

Raymond William Angelo; Albert Lawrence Balan, both of Endwell; David Joseph Huettner, Apalachin; Richard Martin Poliak, Johnson City, and John Frank Shipley, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

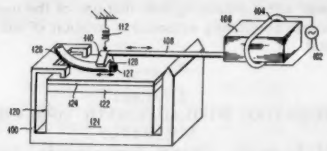
Filed June 30, 1971, Ser. No. 158,580
Int. Cl. B23k *31/02, 35/36*
U.S. Cl. 29—495 **8 Claims**

There is disclosed the use of synthetic organic reactive polymer resins and other materials as soldering fluxes. These resins contain "chemical functionalities", i.e., radicals therein which provide active hydrogen for removing the oxides from the metal substrate during the soldering operation. There are essentially three types of applications as follows. The materials, distinct from known rosin fluxes, do not harden and may be easily removed with solvents. The chemical functionalities may be such that they result in resins which are thermoplastic and can remain on the solder joint to enable resoldering. Alternatively, the chemical functionalities can be chosen such that the resin fluxes chemically cross-link to form thermoset polymers which remains at the solder joint, the cross-linked polymers also functioning to reinforce the strength of the solder joint.

3,791,028
ULTRASONIC BONDING OF CUBIC CRYSTAL-STRUCTURE METALS

Leo Missel, Palo Alto, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 17, 1971, Ser. No. 181,502
Int. Cl. H01r *43/00;* **H05k**
U.S. Cl. 29—628 **6 Claims**

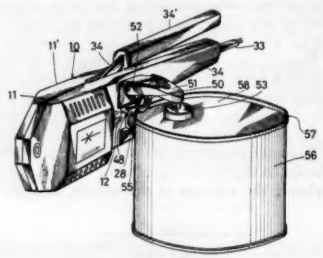


Improved corrosion resistant, high ductility ultrasonic bonds are formed between two cubic structure metallic members such as a copper wire and a copper clad printed circuit board. Each of the members is coated, preferably by plating with a smooth layer of dead soft gold prior to bonding. The coated members are then ultrasonically bonded together. The bond formed is preferably a gold-to-gold joint with no contact between the cubic structure metallic members. This bond is unexpectedly much stronger than the dead soft gold of which it is comprised. Preferred plating and bonding parameters are discussed and analyzed.

3,791,029
ELECTRICALLY POWERED CAN OPENER

Osamu Yamamoto, 56, Koroku, ohata Moriyama-ku, Nagoya, Japan

Filed May 12, 1972, Ser. No. 252,907
Claims priority, application Japan, June 12, 1971, 46/42034
Int. Cl. B67b *7/38*
U.S. Cl. 30—4 R **2 Claims**

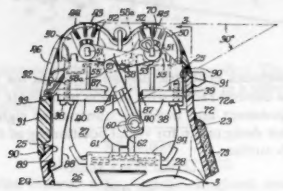


An electrically powered can opener has a driving wheel actuated by an electric motor to move the can opener itself around a can to be opened. By lowering a lever carrying a rotary cutter, an arm is actuated to close temporarily a switch of the electric motor circuit. On piercing of the rotary cutter into a can lid, the switch is closed by the reaction force of can opening operation and the lever is locked. When the reaction force disappears, the electric motor is deenergized automatically.

3,791,030
ELECTRIC DRY SHAVER WITH INCLINED SHAVING HEAD

Wilbur C. Jackson, Wheaton, and William P. Beck, Westchester, both of Ill., assignors to Sunbeam Corporation, Chicago, Ill.

Division of Ser. No. 831,179, June 6, 1969, Pat. No. 3,639,984. This application Oct. 6, 1971, Ser. No. 186,855
Int. Cl. B26b *19/12*
U.S. Cl. 30—43.9 10 Claims

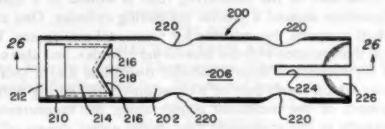


Electric dry shaver having the driving connection between the cutting assemblies in the shaving head and the shaver motor include elongated lever arms which overlap each other. The motor and battery power supply for the shaver are interconnected and supported between the shaving head and the housing by apertured yoke members.

3,791,031
STRAPPING SEVERING TOOL

Jack Brothers, 34 St. Mary Dr., Succasunna, N.J., and Walter J. Puzia, 3 Richard Dr. West, Mount Arlington, N.J.

Continuation-in-part of Ser. No. 124,822, March 16, 1971, abandoned. This application May 23, 1972, Ser. No. 256,155
Int. Cl. B26b *11/00*
U.S. Cl. 30—124 12 Claims



A simple longitudinally-extending body defines the tool, the body having enveloping surfaces for engaging strapping banding and to accommodate the travel of the tool with a strapping banded item. One or more of the surfaces defines a severing edge for severingly parting the banding, i.e., the strapping, upon the terminal-end handle of the tool being raised or moved transverse to the strapping. In some embodiments, the tool further defines means for clasping and securing juxtaposed terminal ends of strapping, that the strapping might be secured about the item — shipping crate, or whatever.

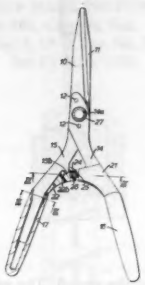
ERRATUM

For Class 30—254 see:
Patent No. 3,791,013

3,791,032
HAND TOOLS

Edward A. Rogers, Ashford Common, England, assignor to Wilkinson Sword Limited, London, England

Filed June 30, 1972, Ser. No. 268,018
Claims priority, application Great Britain, July 15, 1971, 33,258/71
Int. Cl. B26b *13/00*
U.S. Cl. 30—271 4 Claims

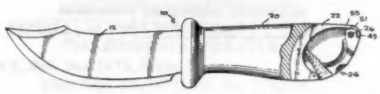


In a hand tool of the kind comprising two co-operating members which are arranged to be moved towards and away from one another by handles which are connected to the respective co-operating members, there is provided two abutment members, each abutment member being secured to a respective handle, whereby movement together of said handles is limited by engagement of said abutment members one with the other.

3,791,033
SKINNING KNIFE

James L. Regan, 409 Dunkel St., Fairbanks, Alaska

Filed Mar. 7, 1972, Ser. No. 232,426
Int. Cl. B26b *29/02*
U.S. Cl. 30—287 4 Claims



A skinning knife with a handle having a pivotal skinning blade is disclosed with the skinning blade comprising a main blade member and a tip blade member perpendicular to the main blade member. A tip sheath is movable to cover the tip for a gutting operation but leaves the cutting edge of the main blade clear for slicing the hide; another embodiment shows the tip being of conical shape.

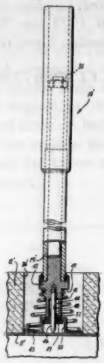
3,791,034
HOLE PUNCHING TOOL

Charles M. Carver, 435-19th Ave., San Francisco, Calif.

Filed Mar. 23, 1972, Ser. No. 237,451
Int. Cl. B26f *1/24*
U.S. Cl. 30—367 10 Claims

A tool for forming pilot holes disposed accurately in a utility passage cover or the like through a layer of flooring. A circle saw uses the pilot holes to cut larger holes through the utility passage cover via an opening formed through a layer of flooring material overlying the utility passage. The tool comprises an elongate staff terminating in a punch portion at one end thereof. An anvil element is carried by the staff at one end and a hammer element is carried by and movable along the staff into and out of engagement with the anvil element for striking

blows thereagainst to drive the punch. Guide means carried about the punch portion engage the side walls of the opening



to accurately position the punch. The punch element moves freely through the guide during driving of the punch.

3,791,035

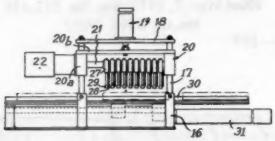
INSTALLATION FOR PRODUCTION OF SOFT AND WASHED-CURD CHEESES

Jean-Pierre Barbier, and Jean-Pierre Feugnet, both of Retiers, France, assignors to Laiteries E. Bridel, Retiers, France

Division of Ser. No. 874,488, Nov. 6, 1969, Pat. No. 3,756,238. This application Oct. 21, 1971, Ser. No. 191,502

Int. Cl. A01j *25/06*

U.S. Cl. 31—46 **1 Claim**



Installation for production of soft and washed-curd cheeses, including a device for molding washed-curd, consisting of giant molds, each having the section of the final cheese product and capacity corresponding to a multiple of the final cheese volume, said molds being grouped in units; a drainer device including means for turning over the mold units by imparting to them a tilting motion, followed by a pendular one, to drive out the serum; and a device for cutting the molded curd taken out of the mold into slices to the final dimensions of the cheeses, including a cutting device equipped with means to adjust knife spacing in function of the length of the molded curd in order to obtain equal curd parts regardless of the length of molded curd.

3,791,036

DRAFTING INSTRUMENT

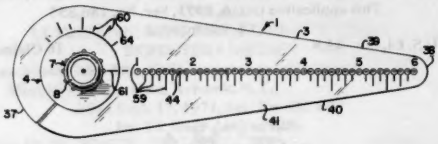
Leslie V. Stober, Jr., and Victor C. Mathis, both of 13006 Raytown Rd., Kansas City, Mo.

Filed July 3, 1972, Ser. No. 268,525

Int. Cl. B43l *9/04*

U.S. Cl. 33—27 C **8 Claims**

A drafting instrument for drawing circles and arcs, said instrument including an elongate arm adapted to overlie, in substantially parallel relation, a work surface on which a circle or arc is to be drawn, said arm having a plurality of marking device receiving apertures therethrough and having indicia to indicate the position of the apertures. The instrument or compass also includes eccentric adjusting means for fine adjustment of the desired radius with indicia to indicate the amount of fine adjustment and includes transparent sighting means with a center designation for visual positioning of the compass on the work surface.



3,791,037

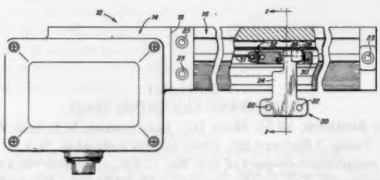
LINEAR ENCODER

James J. DiCiaccio, Somerville; John W. Gjertsen, Bedford, and Alfred S. Nathanson, Brookline, all of Mass., assignors to Itek Corporation, Lexington, Mass.

Filed Feb. 17, 1972, Ser. No. 227,138

Int. Cl. G01b *3/10, 7/02*

U.S. Cl. 33—125 R **6 Claims**



A linear encoder for precisely measuring distances along a measurement axis. One end of a flexible measuring tape is attached to an object, the movement of which is to be measured. The remainder of the measuring tape is wound in a helical configuration around a precise measuring cylinder. One central shaft supports the cylinder for rotational movement. The central shaft rotates with the measuring cylinder, and also supports for rotation a rotary encoder disc plate and a second cylinder which forms part of a constant torque spring motor. Movement of the measured object along the measurement axis results in the measuring tape being either drawn off or wound upon the measuring cylinder. This causes rotation of the measuring cylinder on the central shaft which in turn causes rotation of the encoder disc plate. A reading station adjacent to the encoder plate produces a digital output signal indicative of rotational movement of the encoder plate which is in turn indicative of movement of the measured object along the measurement axis. The constant torque spring motor maintains the measuring tape under constant tension.

3,791,038

MEASURING INSTRUMENT

Nicholas G. Polydoris, Kenilworth, and Burnell J. Wollar, Barrington, both of Ill., assignors to E N M Company, Chicago, Ill.

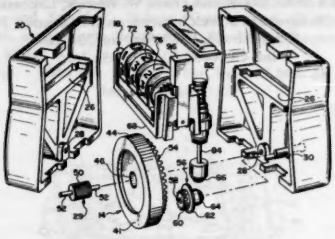
Filed Nov. 8, 1971, Ser. No. 196,358

Int. Cl. G01b *3/12*

U.S. Cl. 33—141 R **1 Claim**

A measuring instrument for measuring linear distance on a surface by rolling a wheel on the surface along the linear

distance to be measured. The wheel is mounted in a housing, and the wheel is drivingly connected to a counter which indicates the distance which the wheel has rolled. The counter is calibrated to indicate linear measurement in a selected system of measurement.



3,791,039

BENCH TEST CENTRES

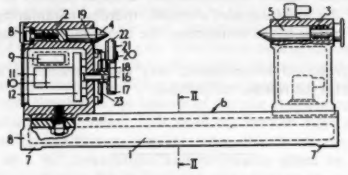
Charles Vivian Marrett Allix, London, England, assignor to C. V. Precision Tools Limited, Chiswick, London, England

Filed Dec. 31, 1970, Ser. No. 103,227

Claims priority, application Great Britain, Jan. 6, 1970, 672/70

Int. Cl. B23b *33/00*; **G01b** *5/10*

U.S. Cl. 33—174 Q **4 Claims**



The component testing apparatus described comprises bench test centres. A headstock and a tailstock are mounted on a base; each stock has a body in which a centre is mounted. The component, when under test, is arranged between the two centres, which are coaxial. The headstock includes a drive for rotating the component under test. A brake is also provided to stop rotation of the component at a selected position.

3,791,040

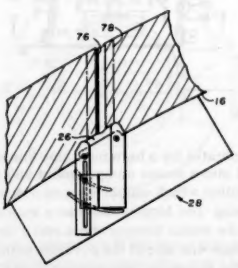
RECESS TEMPLATE

James Marvin Conner, Chattanooga, Tenn., assignor to Combustion Engineering Inc., Windsor, Conn.

Filed Apr. 7, 1972, Ser. No. 243,524

Int. Cl. G01b *5/20*

U.S. Cl. 33—174 G **2 Claims**



A manually manipulatable template is disclosed having particular utility in giving an indication of the amount of material which must be removed to accurately machine a uniform depth, uniform diameter recess in a spherical surface. A parallel linkage having members bearing the desired recess profile is pivotally attached to a mounting plate one edge of which has a radius of curvature conforming to that of the spherical surface. The parallel linkage is particularly unique in that a constant distance is maintained between the profile bearing members, as the linkage is rotated on the mounting plate.

3,791,041

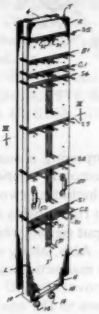
SHELF MARKING PUNCH

David A. Phillips, Box 101, Coppell, Tex.

Filed May 4, 1972, Ser. No. 250,217

Int. Cl. B26f *1/00*

U.S. Cl. 33—189 **4 Claims**



A shelf marking punch comprising a support plate having a lower end positioned along a floor and having spring retractable punch elements arranged in rows spaced vertically and horizontally over the plate. The rows have indicia adjacent thereto for designating one row or a plurality of rows of punches arranged to correspond to positions at which brackets should be mounted for various shelf arrangements employed in residential building.

3,791,042

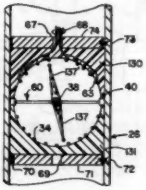
PENDULUM TYPE BOREHOLE DEVIATION MEASURING APPARATUS

Forrest E. Bell, Box 1675, Pecos, Tex.

Filed Sept. 13, 1971, Ser. No. 179,824

Int. Cl. G01c *9/06*; **E21b** *47/22*

U.S. Cl. 33—304 **5 Claims**



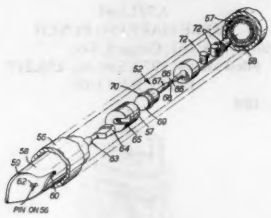
Apparatus for measuring deviation in a vertically disposed borehole. The apparatus is housed within a sub, and the drilling operation can be momentarily suspended at any time and the hole deviation measured. The apparatus includes a plurality of spaced apart pendulum type sensor devices, each connected to an oscillator which produces a signal of a frequency which is proportional to the magnitude of the deviation. A receiver located at the surface of the ground discriminates between the various frequencies of the signals and correlates the frequency reading with hole deviation.

3,791,043

INDICATING INSTRUMENTS

Michael King Russell, Cheltenham, England, assignor to Scientific Drilling Controls, Costa Mesa, Calif.

Continuation of Ser. No. 764,157, Oct. 1, 1968, abandoned.
This application June 9, 1971, Ser. No. 151,561
Int. Cl. G01c 9/04; E21b 47/022
U.S. Cl. 33—312 9 Claims



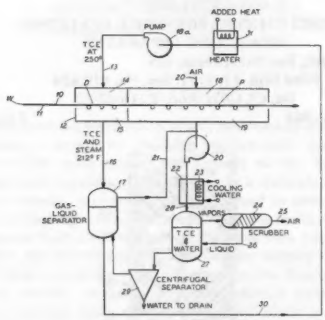
An inclinometer comprising a sensing unit and a readout unit which in use are remotely connected together through a cable, the sensing unit including two inclination sensors with sensing axes arranged at right angles and associated electronic circuitry to provide output signals which are fed to the readout unit through the cable. Also, along each of three coordinate axes there is provided a magnetic sensor, and the readout unit comprises means for converting AC signals from the inclination and magnetic sensors to DC analog signals whereby both inclination and azimuth of said sensing unit are continuously provided.

3,791,044

THROUGH DRYING FOR FIBROUS WEB

Leroy H. Busker, and Robert A. Daane, both of Rockton, Ill., assignors to Beloit Corporation, Beloit, Wis.

Filed June 8, 1972, Ser. No. 260,807
Int. Cl. F26b 3/00
U.S. Cl. 34—9 15 Claims



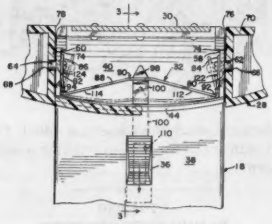
A method and mechanism for the continuous drying of a traveling fibrous web such as a web of paper received from a paper making machine and containing water, including supporting the moving web on a porous screen in a drying zone and directing a flow of heated heat transfer liquid immiscible with the water through the web for evaporating the water and carrying water out with it through the web, separating the immiscible liquid from the water and recycling the immiscible liquid to again pass it through the web in the drying zone for a continuous cycle.

3,791,045

HAIR DRYER WITH ONE FINGER HEAD RELEASE

Earle H. Landis, Leola, and Frank W. Bostick, Lancaster, both of Pa., assignors to Schick Incorporated, Lancaster, Pa.

Filed Feb. 20, 1973, Ser. No. 334,104
Int. Cl. A45d 20/24; E05c 3/06
U.S. Cl. 34—99 7 Claims



A portable hair dryer of the hard hat type, having a head assembly which is pivotally mounted on a head support assembly, is provided with a novel, one-finger head lock release feature by which the head assembly is unlocked from the operating configuration for pivotal movement. The one-finger lock release feature simultaneously unlocks detents at both sides of the head support element, thereby eliminating any twisting at the hinge connecting the head and head support element.

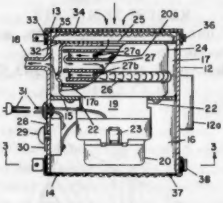
In a preferred embodiment, only two movable parts are required for the release mechanism.

3,791,046

DRYING APPARATUS FOR BARN MILK LINES

Gordon J. Bruggink, Sr., P.O. Box 248, Oostburg, Wis.

Filed Mar. 1, 1973, Ser. No. 337,083
Int. Cl. F26b 25/00
U.S. Cl. 34—104 6 Claims



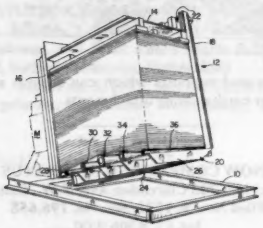
A drying apparatus for a barn milk pipe line system having a casing divided into a motor compartment and a fan compartment by a partition which supports a motor driven blower unit within the casing. The blower unit has a motor housing positioned within the motor compartment and a fan housing positioned on the opposite side of the partition within the fan compartment. A fan within the fan housing draws drying air into the fan housing and forces it outwardly through the fan compartment and casing outlet pipe to the pipe line without contact between the drying air and the motor.

3,791,047

SHEET WINDING AND TURNING APPARATUS

Lamar T. Atwood, Cumberland Center; Joseph E. Rudomski, Saco, and David E. Wilson, Cumberland Center, all of Maine, assignors to Southworth Machine Company, Portland, Maine

Filed Dec. 22, 1972, Ser. No. 317,866
Int. Cl. F26b *13/00*
U.S. Cl. 34—150 **8 Claims**



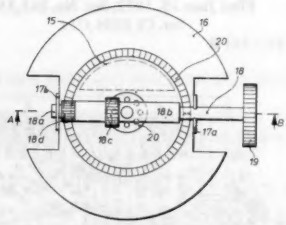
Sheet winding and turning apparatus for printed cardboard and the like wherein a stack of horizontal sheets comprising the stack are rotated about a longitudinal axis, while being confinedly supported, through an angle greater than 90°, and with the boards being projected against a curved surface defined by a plurality of aligned spaced tubes of different sizes, so arranged as to constitute in effect a bowed plate, the tubes being replaceable and interchangeable with different sizes of tubes for altering the curvilinear configuration, to implement breaking any ink pack existing and to bow the sheets to provide enhanced column strength to prevent a tendency of the board slipping to the bottom of the pile as retaining jaws of the turner are opened, with resultant bottom edge pressure preventing winding or aeration when the sheets are rotated back to a 90° orientation, and preferably tilted by the apparatus to dispose the bottom and side edges at an angle from the horizontal and vertical planes with the bottom edges of the sheets being winded and jogged to align sheet edges.

3,791,048

TOY AND TEACHING WATCH, PARTICULARLY DIVER-WATCH

Frank Picard, Eitorf, Sieg, and Ludwig Becker, Vollmersbach, both of Germany, assignors to Sohni & Co. GmbH, Hauptstrasse, Germany

Filed Nov. 13, 1972, Ser. No. 305,845
Int. Cl. G09b *19/12*
U.S. Cl. 35—39 **3 Claims**



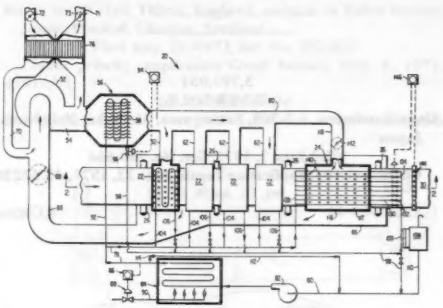
A toy and/or teaching watch is disclosed which comprises a case consisting of an open top upper part and a bottom part, a hand-operable movement mounted on a platen for driving a minute and an hour hand in the correct relative ratio and consisting of an operating knob mounted on one end of an arbor having a larger diameter portion and being rotatably mounted in two lugs bent at right angles out of a platen, said platen and a dial attached thereto having registering windows for displaying other information provided on a crown wheel which meshes with gear teeth on the arbor and carries one hand, whereas a second crown wheel meshing with a pinion on the arbor is coaxially mounted with the first crown wheel and carries the other hand.

3,791,049

DRYING METHODS WITH MOISTURE PROFILE CONTROL

Horace L. Smith, Jr., Richmond, Va., assignor to Smitherm Industries, Inc., Richmond, Va.

Continuation of Ser. No. 46,704, June 16, 1970, abandoned.
This application Oct. 4, 1971, Ser. No. 186,372
Int. Cl. F26b *7/00*
U.S. Cl. 34—16 **7 Claims**



Methods of and apparatus for drying material in web, sheet, and similar forms by a combination of radiant and convective heating in which provision is made for controlling the moisture or other volatiles profile across the width of the material being dried.

ERRATUM

For Class 35—39 see:
Patent No. 3,791,048

3,791,050

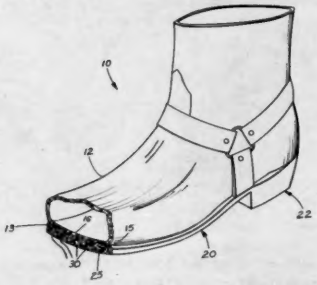
SHOE SOLE AND HEEL

Robert B. Egtvedt, Comstock Park, Mich., assignor to Wolverine World Wide, Inc., Rachford, Mich.

Filed Jan. 19, 1972, Ser. No. 219,081
Int. Cl. A43b *13/18*
U.S. Cl. 36—28 **9 Claims**

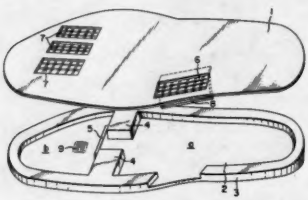
A shoe sole and heel integrally molded of an elastomeric material having a filler of hollow glass spheres dispersed

therein. The spheres are mixed with the elastomeric material prior to molding. The resulting composition is injection



molded in the shape of a heel and sole directly on the bottom of a shoe upper to form a lightweight, relatively inexpensive and wear-resistant shoe bottom.

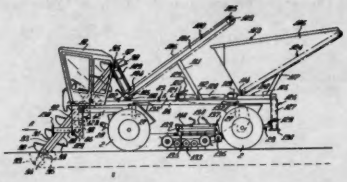
3,791,051
INNER SOLE
Sinya Kamimura, 1-2-308, Sakonyama, Akahi-ku, Yokohama, Japan
Filed June 7, 1972, Ser. No. 260,664
Claims priority, application Japan, June 22, 1971, 46/53226
Int. Cl. A43b *13/38*
U.S. Cl. 36—44 **6 Claims**



An inner sole consisting of an upper sheet of leather having openings for air inlet and outlet, a lower sheet of leather, a rectangular elastic member having a valve at a central part of the sole and placed between said upper and lower sheets of leather along the rims of them and a piece of tape combining the three. Air is compulsorily passed through the inner sole so that the toes in a shoe are kept dry while walking and helps in preventing athlete's foot.

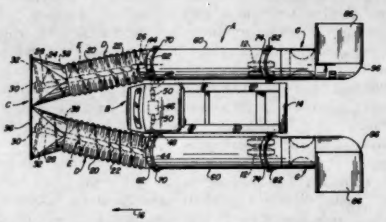
3,791,052
TRACTOR COMPRISING A PIVOTABLE DRIVER SEAT
Cornelis Van Der Lely, 7, Bruschenaain, Zug, Switzerland
Filed Jan. 25, 1971, Ser. No. 109,311
Claims priority, application Netherlands, Jan. 26, 1970, 7001034; Feb. 19, 1970, 7002381
Int. Cl. A01b *35/00*
U.S. Cl. 37—8 **13 Claims**

A tractor has a driver seat mounted on a body which is preferably flat. The seat is connected to the frame by a pivotable arm so that the seat can be moved laterally relative to the remainder of the tractor. The tractor has a hydraulic system,



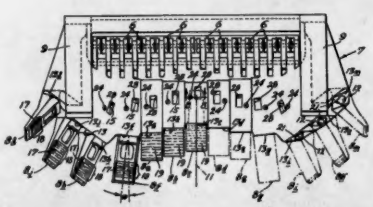
including lifts and supports which can furnish support and connection for earth moving attachments.

3,791,053
SNOW COMPACTING APPARATUS
Frank D. Breckbill, 703 Clarendon Ave. N.W., Canton, Ohio
Filed Nov. 8, 1971, Ser. No. 196,658
Int. Cl. B30b *9/00*
U.S. Cl. 37—10 **7 Claims**



An apparatus for compacting snow includes a conveyor screw rotatably positioned in an elongated housing. The housing and screw each have a substantially uniform cross-sectional shape along their entire lengths. The screw has a discharge end portion and restriction means is positioned in the housing spaced from the discharge end of the screw. The screw forces snow through the restriction means for compressing the snow to a much smaller volume. The size of the opening through the restriction means is automatically variable in accordance with the density of the snow being forced therethrough.

3,791,054
LIP CONSTRUCTION FOR BUCKETWHEEL EXCAVATORS
Stanton F. Bierwith, San Leandro, Calif., assignor to Great Canadian Oil Sands, Limited, Toronto, Canada
Filed June 15, 1972, Ser. No. 263,336
Int. Cl. E02f *3/24*
U.S. Cl. 37—141 R **4 Claims**



A lip for an excavating bucket has a row of sockets in each of which a respective excavating tooth is mounted, the center of the lip being relieved (i.e., offset with respect to the corners

thereof) in two mutually perpendicular planes, such that the corner teeth do the initial excavating without interference from the center teeth, in both forward and lateral movements of the bucket. The combination of the shorter teeth used in the center of the lip plus the relief mentioned causes the corner teeth to engage the working face in advance of the other teeth, in both forward and lateral bucket movements.

3,791,055

APPARATUS FOR IRONING ARTICLES OF LAUNDRY

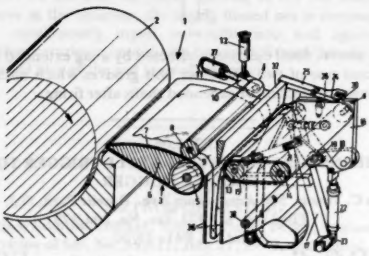
Wilhelmus Joannes Cornelius Maria Bazelmans, Nr. 122, Provincialeweg, and Jozef Alfons Maria Bazelmans, Lepelkesweg 2, both of Veldhoven, Netherlands

Filed Feb. 5, 1973, Ser. No. 329,329

Claims priority, application Netherlands, Feb. 4, 1972, 7201521

Int. Cl. D06f *69/02*

U.S. Cl. 38—11 **7 Claims**



Apparatus for ironing articles of laundry, comprising an ironing machine operating with a mangle roller, a fixed feed device, a movable feed device which consists of one or more drivable endless belts extending around guide rollers disposed in parallel relationship to the guide rollers of the fixed feed device, said movable feed device being disposed in a framework movable back and forth between two end positions and a plate movable above the shaft transversely or substantially transversely of the plane of transportation of the movable feed device, whereby the framework is connected to a pneumatically or hydraulically drivable rocker mechanism which is prestressed in such manner that in one end position a force is exerted which is directed towards the other end position.

3,791,056

CONTINUOUS PRESSING MACHINE FOR TEXTILE FABRIC

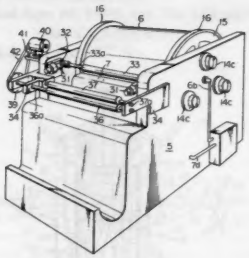
Katsumi Inoue, Suzuka, and Motokichi Fujiwara, Yokkaichi, both of Japan, assignors to Toyobo Co., Ltd., Osaka, Japan

Filed Nov. 17, 1972, Ser. No. 307,532

Int. Cl. D06f *63/00, 65/00*

U.S. Cl. 38—56 **8 Claims**

Continuous pressing machine provided with a heating cylinder and at least one pressing bed member having an arched concave surface facing said cylinder. While turning on its own axis, the axis of the cylinder moves with a planetary motion around the geometrical center of an assumed cylindrical surface a portion of which is defined by the arched concave surface of the bed member so that the cylinder rolls upon the arched concave surface of the bed member without slip. The bed member is urged toward the cylinder under a predetermined pressure. The cylinder and the bed member



are maintained at a predetermined temperature during the operation. A fabric is fed into a space between the cylinder and the bed member.

3,791,057

SHEET STRAIGHTENING AND TENSIONING APPARATUS

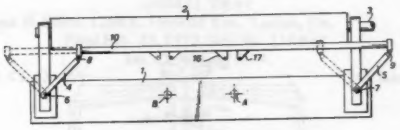
Roger Smith Hall, Thirsk, England, assignor to Baker Perkins Jaxons Limited, Glasgow, Scotland

Filed Aug. 24, 1972, Ser. No. 283,413

Claims priority, application Great Britain, Sept. 8, 1971, 41911/71

Int. Cl. D06f *67/04*

U.S. Cl. 38—143 **5 Claims**



Apparatus for tensioning the edge of a sheet of flexible material, comprising two clips each capable of gripping a corner of the sheet, and means for mounting and controlling the clips so that they move between a first position wherein the clips lie side-by-side at a first loading station to one side of the centreline of the apparatus, and a second position wherein the clips lie side-by-side at a second loading station to the other side of the centreline of the apparatus, and, during each successive movement between the first and second positions, a third position wherein the clips are separated in positions substantially symmetrical about the centreline.

3,791,058

VISUAL EFFECT PRODUCER

Michael J. Mollica, 1435 Fayette Ave., Reading, Pa.

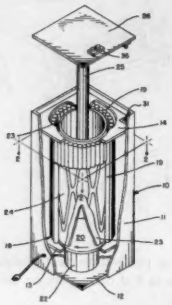
Filed Apr. 27, 1972, Ser. No. 248,114

Int. Cl. G09f *11/02*

U.S. Cl. 40—33 **7 Claims**

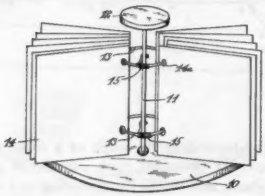
A device for providing attractive visual effects consisting of a source of black light, a rotatable, hollow cylindrical translucent element carrying a pattern subject to fluorescence surrounding the source of black light, a stationary, hollow, cylindrical lens system having surface undulations and suitably composed of a continuous series of contiguous clear plastic rods, or rod-like portions, surrounding the rotatable patterned element and an outer housing having translucent lateral walls composed of a smoked or tinted plastic, glass or the like, the housing enclosing the elements previously referred to. Upon

energization of the device, the black light causes the pattern on the rotating cylindrical element to fluoresce and the light rays thereby produced impinge upon the stationary lens



system which, due to refraction of the light rays caused thereby, transmits a distorted pattern image through the translucent walls of the outer casing as the pattern rotates.

3,791,059
ROTARY CARD FILE RINGS
Aaron H. Shneider, 2835 N. Western Ave., Chicago, Ill.
Filed July 27, 1972, Ser. No. 275,712
Int. Cl. G09f *11/00*
U.S. Cl. 40—72 **1 Claim**

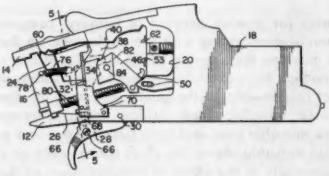


The rings of a rotary card file serve to impale a group of cards which are slidable along the rings. In the present improvement each ring has a gap for the insertion or removal of cards; and a closely-wound spring forms a closer for the gap. One end of the ring is plain for fitting one end of the closer thereon, while the other end of the ring is made with an inward bend leading to a stop in the central region of the ring. The other end of the closer has an eye freely impaled on the inward bend, permitting the closer to swing down to pendent position when its first-mentioned end has been drawn off the plain end of the ring. This creates the gap; and the closer can then be pushed back along the inward bend toward the stop to hang out of the way.

3,791,060
CONVERTIBLE BOLT ACTION RIFLE
Norman K. Weaver, Rt. 3, Poplar Bluff, Mo.
Filed Mar. 8, 1973, Ser. No. 339,136
Int. Cl. F41c *11/00, 15/00*
U.S. Cl. 42—16 **5 Claims**

A bolt action rifle is convertible for use by either right hand or left hand shooters through alteration of the position of the bolt actuating handle and the shell ejector. The bolt actuating handle is mounted by screw means extended through a reversible sleeve. Shell ejection is effected by a lug extended into a selected one of two off-center bolt grooves which alters the direction of ejection of expended shells after firing.

3,791,061
MEANS FOR CONVERTING A PULL TRIGGER TO A RELEASE TRIGGER
John C. Tirone, 500 Amsterdam Ave., Roselle Park, N.J.
Filed Dec. 6, 1971, Ser. No. 204,979
Int. Cl. F41c *19/00*
U.S. Cl. 42—41 **12 Claims**

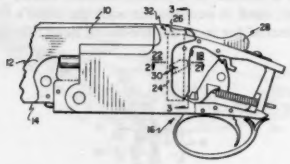


In a trigger device with a firing pin and hammer means for striking said pin, and sear means for releasing said hammer means, with connector means operatively connected to said sear means for moving it to release said hammer, and a pull trigger engaging said connector means to actuate to release said sear means, release trigger means pivotally connected to the trigger device, said pull trigger having means thereon for engaging said hammer means to prevent it from being released, and detachable cam means disposed on said pull trigger for engagement with said release trigger to prevent release of said hammer means until pressure on said pull trigger is released.

3,791,062
TOP LEVER MECHANISM FOR FIREARMS
Jean Paul Jules Martial, Haccourt, Belgium, assignor to Fabrique Nationale Hestal S.A. en Abrege FN, Herstal-lez-Liege, Belgium
Filed Jan. 8, 1973, Ser. No. 321,793
Claims priority, application Belgium, Jan. 14, 1972, 778024
Int. Cl. F41c *11/08*
U.S. Cl. 42—44 **9 Claims**

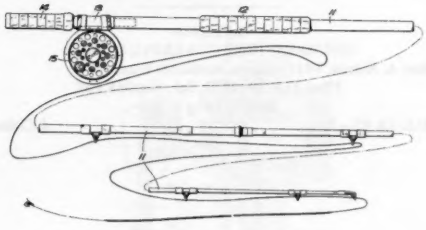
A device for overcoming axial play of the top lever of a firearm such as that found on multi-barreled shotguns. The

device includes a receiver having journalled therein a rod or post attached to and extending downward from an operating arm of the top lever. The rod is adapted with a slanted blind opening having an axis which is inclined upwardly towards the operating arm. A spring biased pin is carried within the opening and extends outwardly therefrom a distance sufficient to



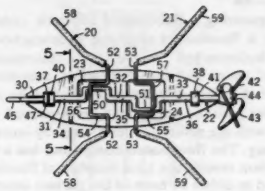
engage a groove penetrating the wall of the receiver. As wear occurs on the pin, the blind opening in the rod and/or the groove in the receiver, the spring biased pin is automatically and continuously urged outwardly into and against the receiver insuring a continuous precision fit and thereby avoiding axial play of the rod journalled therein.

3,791,063
METHOD OF CASTING
William Edmund Harker, Midland Hotel, Derby, England
Division of Ser. No. 56,811, July 21, 1970, abandoned. This application Dec. 8, 1972, Ser. No. 313,539
Int. Cl. A01k *69/00*
U.S. Cl. 43—4.5 **3 Claims**



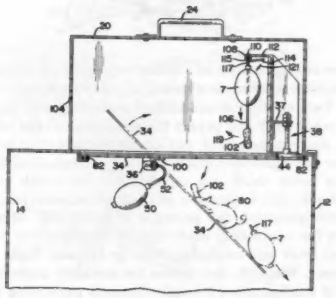
A method of casting a line and fly when fishing by means of a fishing rod having a detachable handle, the detachable handle having a reel attached thereto, comprising the steps of separating the detachable handle carrying the reel from the rest of the rod, and holding the detachable handle with the reel in one hand and the rest of the rod in the other hand, the reel being restrained to prevent rotation thereof, making a back cast, bringing the hands near each other with the reel restrained, releasing the reel, and immediately thereafter making a forward cast with the hand holding the rod, while simultaneously drawing the other hand holding the detachable handle and reel away from the hand holding the rod, thus accelerating the reel ready to pay out line, permitting line to pay out, and reconnecting the detachable handle to the rest of the rod after the line and fly have dropped on the water in front of the angler, and retrieving the line by winding the line on the reel.

3,791,064
FISHING LURE
Edmond J. Van Iseghem, Jr., c/o Mueller-Perry Co. Inc., 1200 So,-Florissant Rd., St. Louis, Mo.
Filed Apr. 10, 1972, Ser. No. 242,408
Int. Cl. A01k *85/06*
U.S. Cl. 43—26.2 **4 Claims**



This lure includes a body having a propellor driven longitudinal crank shaft which induces oscillating motion into front and rear depending leg elements without positive connection between the legs and shaft. The body includes separable upper and lower portions held together by removable snap rings to facilitate replacement of the legs. The lure can be used to simulate surface active or sub-surface active bait, and in the former case is preferably formed from relatively buoyant materials.

3,791,065
ANIMAL TRAP
Frank H. Snow, 1208 E. Idlewild Ave., Tampa, Fla.
Filed Feb. 23, 1973, Ser. No. 335,042
Int. Cl. A01m *23/04*
U.S. Cl. 43—69 **24 Claims**



This invention relates to an animal trap including an air tight chamber in which an animal is forced by automatic release of bait by the animal, when located on an animal attracting means. A plurality of weights are interconnected to various pieces of bait arranged in predetermined configuration over a movably mounted chamber entrance door wherein removal of the bait causes release of at least one weight so as to drop onto the entrance door thereby opening it and forcing, due to gravity, the animal to fall into the chamber. The entrance door is normally held in a closed position by a releasable connector means. The chamber may or may not be air tight causing death of the animal by suffocation.

3,791,066
ENHANCING THE OPERATION OF A GASOLINE ENGINE

Louis E. Furlong, Westfield; Abraham A. Zimmerman, New Providence, and Hugh F. Shannon, Scotch Plains, all of N.J., assignors to Esso Research and Engineering Company, Linden, N.J.

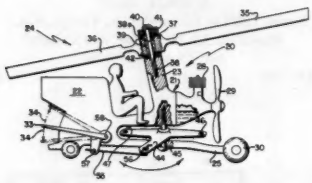
Filed Sept. 1, 1971, Ser. No. 177,162
Int. Cl. C10l 1/22
U.S. Cl. 44—66 **6 Claims**

By incorporating a fluorinated aliphatic compound, more particularly a fluorinated aliphatic hydrocarbon, fluorinated aliphatic hydrocarbyl amine, or fluorinated aliphatic hydrocarbyl amine salt into a gasoline composition the distribution of the air/fuel mixture in the intake manifold of a multicylinder gasoline engine will be improved when that engine is run with the resulting blend, thereby increasing operating efficiency. The fluorinated compound has a total of about 8 to 30 carbon atoms, the total number of fluorine atoms that are attached to either or both of the carbon atoms that are the terminal carbon atom of an aliphatic chain and the carbon atom immediately adjacent thereto being at least three. Representative fluorinated compounds include perfluoro kerosene and perfluoro tributyl amine.

3,791,067
MODEL AUTO-GIRO

Murray Guttman, 250 Johnochs Dr., Saddle Brook, N.J.

Filed June 20, 1972, Ser. No. 264,629
Int. Cl. A63h 27/12
U.S. Cl. 46—75 **10 Claims**



Four configurations of a model auto-giro are disclosed with appropriate methods and means of control for each configuration. Two configurations utilize a pivoting stabilator and a fixed rotor shaft and permit the auto-giro to take off, ascend, loop, descend and land, but do not permit it to hover. Two further configurations utilize a fixed horizontal stabilizer and a tiltable rotor shaft, the combination of which permit the model auto-giro to perform all the flight maneuvers of the first two configurations and permit it to hover also. Methods and means for controlling each type of configuration by captive control lines and confining them to circular flight paths are disclosed. Methods and means for remotely controlling each type of configuration by radio controls permitting free flight are also disclosed.

3,791,068
DUAL FACE ILLUMINATED DOLL

Mary Pietrowiak, 1304 Maple Ave., Baltimore, Md.

Filed Aug. 22, 1972, Ser. No. 282,759
Int. Cl. A63h 3/12
U.S. Cl. 46—228 **3 Claims**

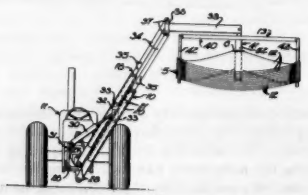
The doll is preferably made of a transluscent flesh colored resilient plastic material, having a hollow body, legs and arms, and a plurality of extra interchangeable heads representing an assortment of different persons, the body being provided with electric power means for lighting a bulb which is mounted in the neck of the body and extends into the hollow of any head that might be mounted thereon. Upon switching on the light, the head glows more or less brightly depending on the power of the light bulb and the transparency of the flesh colored plastic material the head is made of. Additional bulbs may be used in the other hollow parts of the body to light it all up when desired. Blinkers may be included in the circuit to produce an interrupted lighting effect, and a timer may be used to limit the period of lighting. A child will be readily attracted by a doll of this type, especially if a suitably recognizable head of a doctor or a nurse, mother, sister, brother or other person, used in accordance with the child's show of interest, is selected for it. A double-faced head may be used to

instantly alternate between the two selected persons emulated, by turning the desired head forwardly on the body. The double faced head may further be provided with a wiglet, the hair of which may be shifted on top of the head so as to cover the face turned to the rear. In another modification, by matching the clothing exposed on the opposite sides of a body with the faces on said sides, all that needs to switch from simulating one person to the other is to turn the body over from one side to the other as desired. The doll may be battery powered or it may be plugged into the house current for supplying the current to the light bulb through a switch on the body which may be concealed by a portion of the clothing.

3,791,069
ORCHARD TREE COVERING DEVICE

Roy A. Nelson, 1419 Mahon, Richland, Wash.

Filed Aug. 30, 1972, Ser. No. 285,107
Int. Cl. A01g 13/02
U.S. Cl. 47—21 **4 Claims**



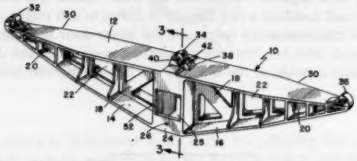
An orchard tree covering device is described for use in placing individual covers or strips of cover material over orchard trees to prevent frost damage. The device is adapted to fit on conventional tractors and includes an adjustable elevational support and a cover holding magazine. The magazine is designed to hold a plurality of covers and includes means for selectively releasing individual covers onto trees below. In an alternate form, the covers are connected in strips and rolled onto spools. The strips may then be reeled out by the device over long rows of trees.

3,791,070

CROSS BEAM FOR GRAPE STAKES

James C. Roberts, 1860 Jeffrey, Escondido, Calif.

Filed Aug. 9, 1972, Ser. No. 278,986
Int. Cl. A01g 17/06
U.S. Cl. 47—46 5 Claims



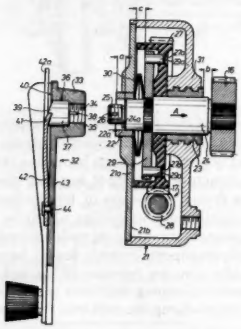
A cross beam for grape stakes comprising an upper planar member supported by a housing member that projects normal thereto, and has an opening in the bottom for fitting on the top of a grape stake, and with second planar members projecting from the ends of the first planar member at an angle thereto to the sides of the housing, and ribs positioned between the planar members for grasping the grape wires, all being made of a ductal plastic material that provides a rigid support that can stand abuse, is relatively light weight, and that does not wear the galvanizing off of the grape supporting wire lines.

3,791,071

MOTOR VEHICLE CONSTRUCTION

Bernd Niklaus, Plittersdorf, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed June 26, 1972, Ser. No. 266,444
Claims priority, application Germany, July 8, 1971, 2134027
Int. Cl. E05f 15/14
U.S. Cl. 49—140 11 Claims



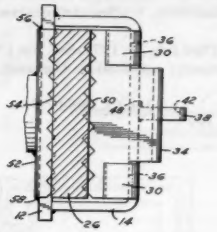
A rotatable shaft can be turned to shift a window or similar component of a motor vehicle. A coupling is provided for turning the shaft and includes one coupling section which is fixedly mounted on and turns with the shaft and another coupling section which surrounds the shaft and is adapted to be driven by a motor. A biasing spring urges the shaft axially of itself so that the section of the coupling on the shaft engages the section which is driven by the motor. To operate the arrangement in the event that the motor should fail, a manual crank is provided which can be engaged with a free end portion of the shaft, and an arrangement is provided which, when such engagement is effected, will displace the shaft axially in a sense separating the two coupling sections so that it is not necessary to turn against the resistance of the motor.

3,791,072

GATE ARM CLAMP AND SERRATING LEVER

Harold L. Miller, Grosse Pointe Park, Mich., assignor to Vemco Products Inc., Detroit, Mich.

Filed July 17, 1970, Ser. No. 55,840
Int. Cl. E05c 15/02
U.S. Cl. 49—141 4 Claims



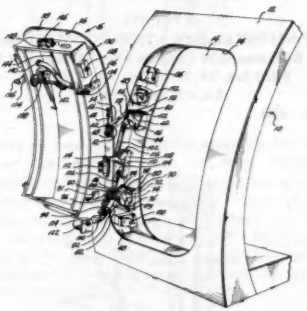
An improved clamp for mounting the wooden arm of an automatic parking gate onto the actuating mechanism of the parking gate. The clamp features a lever operated serrated clamping edge which grips the arm when clamped into place and creates a fracture line in the arm along the serration where the arm will break if struck by an automobile. In the event the arm is broken, the arm, now about 6" shorter, can be reinserted and reused. The arm can therefore be used a number of times after accidental breakage until it is too short for practical use.

3,791,073

AIRCRAFT DOOR WITH MOVING HINGE LINE

Irwin G. Baker, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 28, 1972, Ser. No. 248,445
Int. Cl. E05d 15/40
U.S. Cl. 49—249 18 Claims



An aircraft door and hinge assembly therefor is mounted in an opening in an airframe, which opening lies at an angle with the horizontal plane of the aircraft. The door is mounted on a hinge assembly which provides first for upwardly inclined movement of the door to disengage it from its stop engagement with the opening in the airframe. Thereafter, the hinge assembly provides for outward movement of the door, displacing the hinge axis of the door from a position in which the axis makes an acute angle with the horizontal plane of the airframe to a position at which the hinge axis is substantially perpendicular to the horizontal plane. The door is mounted or hinged on the hinge assembly at two points. The hinge assembly provides for one of the hinge points to move outwardly from the

airframe a greater distance than the other. Thus the hinge axis can be vertically aligned with respect to the airframe. When the hinge axis is vertically positioned the door can swing to an open position away from the opening in the airframe, allowing ingress and egress through the opening.

3,791,074

WINDOW OR DOOR CONSTRUCTION

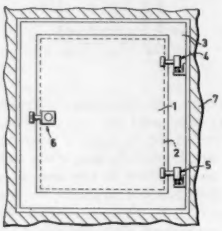
Franz Waffenschmidt, Waffenschmidtstrasse 2, Cologne, Germany

Filed July 27, 1971, Ser. No. 176,362

Claims priority, application Germany, July 29, 1970, 2037517

Int. Cl. E05d *7/04*

U.S. Cl. 49—399 **18 Claims**



A wall or other support has an opening in which one or more frameless glass panes of a window or door are located. The panes are secured to the adjacent support by hinges which are adjustable so as to permit adjustment of the pane or panes within the opening, and which have a portion directly connected with the respective pane, as by welding or bonding. Suitable latches or similar securing means are also provided, and at least one component of such latch or securing means is also directly connected to the respective pane or panes.

3,791,075

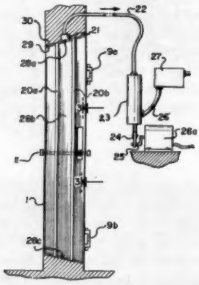
ENVIRONMENTAL-ISOLATION ROOM DOOR-SEAL

Bernard I. Blickman, 536 Gregory Ave., Meehawken, N.J.

Filed Jan. 24, 1972, Ser. No. 220,156

Int. Cl. E06b *7/23*

U.S. Cl. 49—484 **3 Claims**



An environmental-isolation room door-seal in which the mating faces of a door frame and of a door closable thereinto in a preferred embodiment are of structures which define between opposing surfaces thereof a channel circumscribing the outer edges of the door and the inner edge of the door frame extending around the perimeter of the door, including on each of opposite sides of the door channel a sealing strip, each sealing strip also circumscribing the door, and a vacuum pump and a pressure equalizing conduit and switch operatively connected to the channel, with the exhaust of the vacuum pump outlet being directed through a chemical purifying device, whereby the vacuuming of the channel serves both to further lock together the closed door and frame thereof, and to trap and conduct away any air or gases which might under adverse circumstances seep past the inner-door seal into the vacuumed channel, thereby preventing contamination of environment outside of the door of the environmental-isolation room.

3,791,076

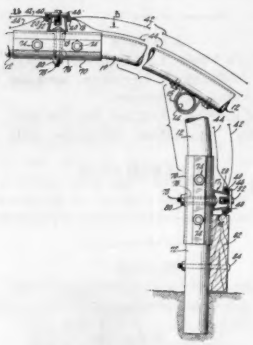
PLASTIC COVERED BUILDING STRUCTURES

Charles C. Gahler, West Long Branch, N.J., assignor to X. S. Smith, Inc., Red Bank, N.J.

Filed Dec. 27, 1971, Ser. No. 212,069

Int. Cl. E04b *1/345*

U.S. Cl. 52—2 **18 Claims**



A plastic covered building structure comprised of a metal frame supporting superimposed layers of plastic sheets having an inflated area between the sheets providing insulation to the interior of the structure. The super-imposed plastic sheets are secured to the frame by means of longitudinally extending rails having longitudinally extending upwardly concave portions and complementary clamping rods adapted to secure the edges of the super-imposed plastic sheets between the rods and the upwardly concave portions of the rail. The rails are adapted to receive clamping members at any point along the length of the rails to clamp the rods into the upwardly concave portions.

3,791,077

METHOD AND APPARATUS FOR STRETCHING STRIP OF SHEET MATERIAL ON RIGID SUPPORTS

Francesco Ventimiglia, via Francesco Crispi, Catania, Italy

Filed Jan. 17, 1972, Ser. No. 218,081

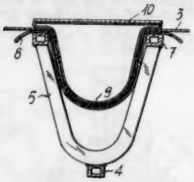
Claims priority, application Italy, Jan. 19, 1971, 19508/71

Int. Cl. E04g *11/04*; **E04b** *1/00, 1/347*

U.S. Cl. 52—2 **8 Claims**

Method for stretching strips of flexible sheets, consisting of

laying the strip on two rigid supports, and above said strip a tubular element, superimposing on the latter an inextensible strap which is restrained at its ends. By inflating the tubular element, an even stretching for the flexible strip is provided.



3,791,078

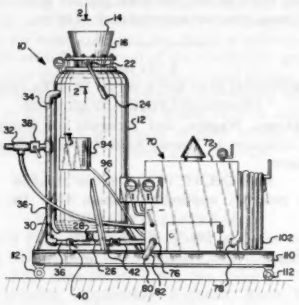
APPARATUS FOR PREPARING A PAINTED METAL SURFACE FOR REPAINTING

Henry Fleisher, 18 Notch Park Rd., Little Falls, N.J.

Filed Oct. 19, 1972, Ser. No. 299,034

Int. Cl. B24c *3/06*

U.S. Cl. 51—5 **13 Claims**



An apparatus is provided for preparing an object having a painted metal surface for repainting which apparatus is a combination sand-blasting, degreasing and steam generating and spraying unit. Separate means for directing a stream of abrasive and air, with or without volatile chemical solvent and/or water, on to the metal surface, and separate steam spray means are employed. Compressed air is employed to propel the abrasive, blow away any abrasive dirt and grease build-up on the metal surface and to drive water into the steam generating unit thereby eliminating the need for expensive motors and pumps.

3,791,079

PRESSURE APPLICATOR FOR SURFACE GENERATING APPARATUS

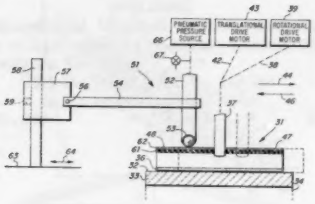
James B. McCallum, Plymouth, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed May 23, 1972, Ser. No. 256,052

Int. Cl. B24b *7/22*

U.S. Cl. 51—56 **13 Claims**

Apparatus for controlling the distribution of pressure between a lapping tool and a work surface being treated. The apparatus comprises structure for applying a predetermined force at a desired position on the moving lap in order to obtain desired pressure characteristics between the lap and the work piece. The structure may be employed to compensate for non-uniform surfacing rates that would otherwise be caused due to the transverse movement of the lap over the work piece. Alternatively, it can be employed to intentionally introduce localized pressure differentials at particular areas between the lap and the work piece to assist in obtaining desired surface characteristics.



3,791,080

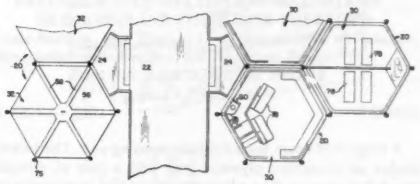
FLOATING OR LAND BASED MODULAR ASSEMBLY FOR HOUSING OR COMMERCIAL USE

John B. Sjoberg, 5330 Opihi St., Honolulu, Hawaii

Filed Sept. 10, 1971, Ser. No. 179,331

Int. Cl. E04b *1/348*

U.S. Cl. 52—79 **11 Claims**



A floating or land based modular assembly for housing or commercial use including one or more selectively interengageable units. Each unit is of polygonal prefabricated shape and comprises complemental base or hull sections and a roof section which sections are spaced apart by supporting columns, the supporting columns being removed to permit collapsing of the unit. Means are provided for joining any desired number of modular units together, and for retaining the assembly in place on water or land.

3,791,081

MULTI UNIT DWELLING STRUCTURE

Laurent Felciai, 34, Place Jean Bart, 59, Dunkerque, France

Continuation-in-part of Ser. No. 143,390, May 14, 1971, abandoned. This application Feb. 23, 1972, Ser. No. 228,672

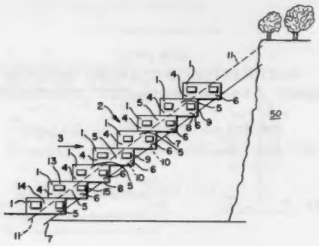
Claims priority, application France, May 5, 1971, 71.17266

Int. Cl. E04b *1/34*

U.S. Cl. 52—79 **6 Claims**

A multi unit dwelling structure comprising a plurality of individual dwelling units positioned and secured together in adjacency. The units may be arranged in a horizontal row or a tier inclined both to the horizontal and to the vertical and the horizontal rows may be arranged in an inclined tier. The structure is supported by a member, such as a cable, positioned to

support the lower portions of each dwelling unit and the units are not suspended below the cable support. The cables are attached to the rooms and the adjoining rooms may be subjected to a compressive pre-stress prior to being attached to the cables.



3,791,082

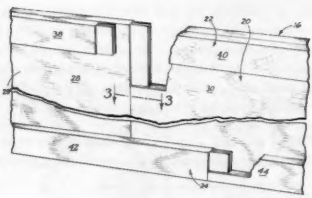
RIDGE ROOF BEAM

J. Dennis Bowling, Battleground, Wash., assignor to Hearin Forest Industries, Beaverton, Oreg.

Filed Aug. 7, 1972, Ser. No. 278,548

Int. Cl. E04c *3/00*

U.S. Cl. 52—79 **11 Claims**



A ridge roof beam for a modular housing unit. The beam includes an elongated plywood web and a pair of elongated wood flanges extending adjacent and parallel to opposite edge margins of the web and secured in face-to-face relation to one face of the web. The web and flanges are each constructed of elongated wood sections bonded together in end-to-end relation. Finger grooves extending along adjacent end edges of the sections interlock to form a secure joint therebetween.

3,791,083

APPARATUS FOR MACHINING BALLS

Klaus Messerschmidt, Schonungen, Germany, assignor to Sebastian Messer-Schmidt Specialmaschinenfabrik, Schonungen, Germany

Filed Sept. 13, 1971, Ser. No. 179,694

Claims priority, application Germany, Oct. 15, 1970, 2050662

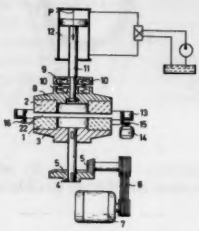
Int. Cl. B24b *5/20*

U.S. Cl. 51—117 **12 Claims**

The specification describes a polishing or lapping machine for steel balls, comprising a stationary disc and a coaxial rotary disc between which the balls are rolled and lapped. The two discs are pressed together by a loading force which is so applied that its line of action intersects a base axis in a specific length of the base axis. The base axis is defined as an axis intersecting the axis of the stationary disc perpendicularly passing through the center of gravity of the stationary disc and through a recess provided in the stationary disc for the introduction and removal of balls. The specific range of the base axis in which the intersection with the line action of the loading force occurs is defined as the range beginning at the center of gravity of the stationary disc and extending away from the center of gravity and away from the recess.

With this arrangement of the line of action of the loading force the force exerted on the balls in the working gap between the discs rises from a minimum at the position of entry into the working gap to a maximum value and then decreases to a minimum value again at the position at which the balls are removed from between the discs.

The parts adjacent to the ends of the working gaps and adapted to feed balls into the working gap between the discs and receive them as they leave the gap are lined with a shock absorbing wear resistant material such as nylon.



3,791,084

GRINDING MACHINE WITH WHEEL DRESS COMPENSATING APPARATUS

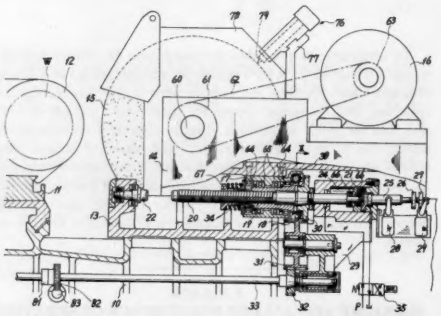
Ichizo Kakumu, Nagoya, and Teruyuki Ito, Kariya, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Aichi-ken, Japan

Filed Oct. 15, 1971, Ser. No. 189,584

Claims priority, application Japan, Oct. 16, 1970, 45-103868

Int. Cl. B24b *49/18*

U.S. Cl. 51—165.87 **6 Claims**

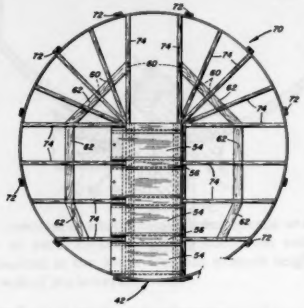


A grinding machine having a feed nut rotatably journalled in a wheel head, a lead screw rotatably journalled in a bed being threadedly engaged with the feed nut, a worm wheel coaxially mounted on the feed nut and a worm rotatably journalled in the wheel head being meshed with the worm wheel is provided with compensating means connectable with the worm to rotate the same and thereby advance the wheel head for compensating for grinding wheel dressing and a motor for rotating the worm in an opposite direction to retract the wheel head for exchanging grinding wheels when the wheel in use has become too worn.

3,791,085
UNLOADING ARRANGEMENT FOR EXISTING CORN CRIBS

Richard B. Groves, 102 S. Water St., Chestertown, Md.

Continuation of Ser. No. 847,038, Aug. 4, 1969, abandoned.
This application Oct. 6, 1971, Ser. No. 187,067
Int. Cl. E04h 7/00; B66b 13/08
U.S. Cl. 52—197 1 Claim

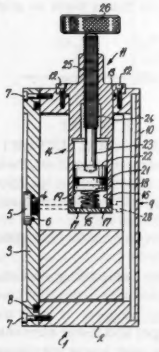


A labor saving arrangement is provided for storing and removing ear corn from existing corn cribs. Hopper structure is described for installation into any shape of existing corn crib to easily convert it for removal of the contents by gravity feed to the unloader sloping beams support steel plating of simple geometrical shapes in a downwardly converging floor which terminates in a gate frame. The gating may be either of the removable board type or consist of slide boards which are manipulated to valve any dispensing rate desired.

3,791,086
FLEXIBLE WALL SURFACE

Ernest Henry Pinn, Richmond, England, assignor to National Research Development Corporation, London, England

Filed June 19, 1972, Ser. No. 264,010
Claims priority, application England, June 22, 1971, 29214/71
Int. Cl. B24d 17/00
U.S. Cl. 51—212 5 Claims



A reference surface, e.g. a lapping surface, is formed on one of the external faces of a hollow pressure vessel. There are elements to vary the internal volume of this vessel, and the volume is filled with fluid. When the surface wears from its true shape, the volume is adjusted so as to change the pressure acting upon the face from the inside, so as to change the contour of the reference surface and compensate for the wear.

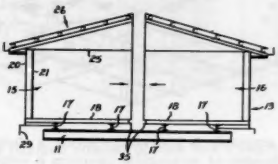
ERRATUM

For Class 52—2 see:
Patents Nos. 3,791,076 and 3,791,077

3,791,087
BUILDING

Barnet Maxwell Sigal, Wingfield, South Australia, Australia, assignor to Sigal Industries Proprietary Limited, Wingfield, South Australia, Australia

Filed Oct. 1, 1971, Ser. No. 185,704
Int. Cl. E04h 9/06; E02d 27/00
U.S. Cl. 52—293 4 Claims

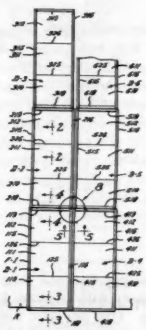


A building having a steel chassis supported on footings and peripheral metal supports which stand out from the chassis and support the outer peripheral walls of the building so that the ground supporting the footings is shielded from the effects of moisture penetration by the building itself.

3,791,088
PREFABRICATED MULTIPLE DOME UNITS OR SKYLIGHTS AND COMPOSITE THEREOF

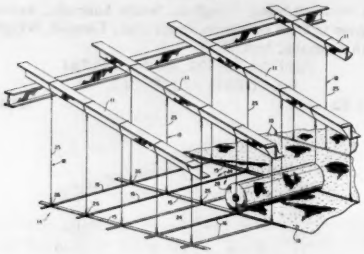
Kiyoshi Sandow, and Thomas L. Anderton, both of Houston, Tex., assignors to Plasteco, Inc., Houston, Tex.

Filed Nov. 8, 1971, Ser. No. 196,382
Int. Cl. E04b 7/18
U.S. Cl. 52—200 7 Claims



Prefabricated multiple dome units or skylights and composite thereof, wherein each multiple dome unit has several domes of transparent or translucent material mounted together on a common frame, and wherein means are provided for assembling a plurality of such dome units into a composite thereof on a building, with the units lapped and interfitted so as to provide a continuous drainage system discharging to the exterior of the units in the composite assembly.

3,791,089
SUSPENDED CEILING
Robert Joe Alderman, Rt. 4, Lawrenceville, Ga.
Filed July 24, 1972, Ser. No. 274,168
Int. Cl. E04b 5/52
U.S. Cl. 52—484 6 Claims



A ceiling assembly is provided wherein a support lattice defining a plurality of rectangular openings is suspended in a horizontal attitude below the roof of the building. A plurality of elongated sheets of ceiling material rest upon and are supported by the support lattice and each sheet extends across a plurality of the rectangular openings. The lattice is supported by wires suspended from the roof structure of the building, with the wires connected at points on the lattice arranged in rows across the lattice, and the sheets of material are placed upon the lattice in rolls and the rolls are unrolled between the suspension wires of the lattice.

3,791,090
BUILDING BLOCK
Alfred Beryl Kniefel, 3510 Nashville Ave., El Paso, Tex.
Filed Dec. 30, 1971, Ser. No. 51,305
Int. Cl. E04c 1/30; A63h 33/10
U.S. Cl. 52—593 3 Claims

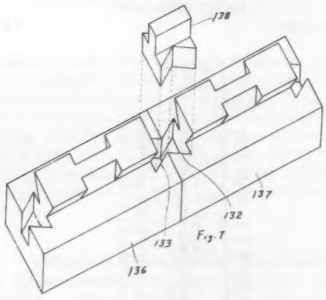
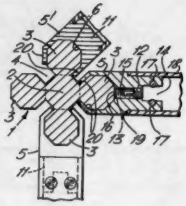


Fig. 7

A building block having dovetail tongue and groove configuration for interlocking with adjacent blocks by sliding in a longitudinal direction. The dovetail tongue protrudes outwardly from one side of the block and has two widened longitudinal end portions have a cross-sectional shape defining an inverted triangular wedge which end portions are interconnected by an intermediate portion rectangular in cross section which intermediate portion extends one-third the length of the tongue. The opposite side surface of the block has a complementary shape inverse to that of the tongue forming a groove of constant depth. The end portions of the groove are of slotted dovetail configuration widening from the opposite side surface inwardly of the block. The ends of the recess have substantially the width of the intermediate portion of the tongue whereby the tongues may be longitudinally slid into the recess for interlocking engagement.

3,791,091
COMPONENTS FOR CONSTRUCTIONAL PURPOSES
Alexander Rubin De Cervin Albrizzi, London, England, assignor to Albrizzi Ltd., London, England
Filed Oct. 27, 1971, Ser. No. 193,048
Claims priority, application Great Britain, Aug. 5, 1971, 36962/71
Int. Cl. E04b 1/38
U.S. Cl. 52—593 10 Claims

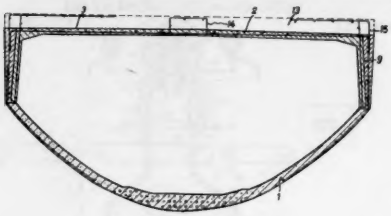


Components for constructional purposes in the form of bars or columns which form male components and female components fixable thereto for coupling with connecting components to make frames of various kinds as for tables or shelving or the like, the bar or column comprising sub-columns of polygonal or octagonal-based section spaced around and integral with a central core, each sub-column being adapted to form a male element of a joint with one or more of the female components which are provided with an open-sided bore having a corresponding polygonal or octagonal-based wall and adapted to embrace a sub-column and be secured thereto at any appropriate position therealong. Columns with sub-columns of identical section form a modular unit for cooperation with a standard form of female component which may be fitted to any one of the sub-columns and be designed for locating and fixation to a standard form of frame component by spigot and socket coupling preferably so that the frame component comes flush with the female component. The female components may be fitted by screws countersunk in channels in the female components to tighten such components on the sub-columns and be designed for connection to the frame components by self-tapping screws in open-sided bores at the sides of the channels to cause them to grip the frame components.

3,791,092
HOLLOW BOX SUPPORT
Adolf Schmitter, Kranstrasse, Altstatten, Switzerland
Filed Oct. 29, 1971, Ser. No. 193,723
Claims priority, application Switzerland, Nov. 3, 1970, 16283/70; Jan. 27, 1971, 1171/71
Int. Cl. E04c 3/00; E04b 1/16; E04c 3/34
U.S. Cl. 52—600 1 Claim

A hollow box support comprising a reinforced lower structural element at least partially formed of concrete, and a reinforced upper structural element at least partially formed of concrete, both said upper and lower elements being separately fabricated. The upper and lower elements are rigidly connected with one another along their lengthwise extending sides connection layers, and viewed in cross-section, the wall of the lower element extends towards the outside in ascending fashion in the direction of and toward the upper element. The connection layers are defined by a respective essentially upright concrete connection layer each of which bears against the associated lengthwise extending sides of both the upper element and the lower element. Reinforcement means incor-

porating reinforcement elements are provided for the upper and lower elements and extend in the transverse direction of the hollow box support. Such reinforcement means extend

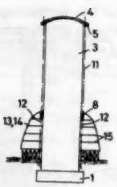


into the concrete connection layers and overlie or overlap one another at such location, and wherein the reinforcement means located at the lower element extends neighboring the outside wall of the lower element.

3,791,093
MULTI-STORY BUILDING AND METHOD OF CONSTRUCTION THEREFOR

Ulrich Finsterwalder, Munich-Obermenzing, and Helmut Bomhard, Starnberg, both of Germany, assignors to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Germany

Filed Oct. 12, 1972, Ser. No. 297,081
Claims priority, application Germany, July 8, 1972, 2233632
Int. Cl. E04h *1/04*; E04g *21/00*
U.S. Cl. 52—745 **2 Claims**



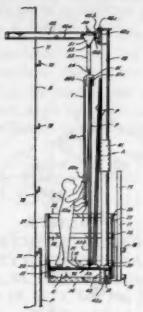
Multi-story building having a central column of reinforced concrete at the upper end of which the story ceilings that surround the column are anchored by means of suspension members and which has a shell that expands outwardly from the upper end of the column, within which extend the suspension members that are anchored on the upper end of the column.

3,791,094
METHOD AND APPARATUS FOR MOUNTING BUILDING PANELS

Joseph R. Shannon, Jr., P.O. Box 40006, Houston, Tex.

Filed Oct. 16, 1972, Ser. No. 297,996
Int. Cl. E04g *21/00*
U.S. Cl. 52—747 **5 Claims**

A method and apparatus for mounting building panels, wherein a plurality of building panels may be raised alongside a building structure and then separately mounted on the structure to form a wall thereof, which method and apparatus

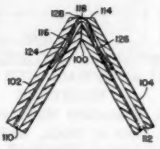


requires a reduced number of men and a much safer operation.

3,791,095
DECORATIVE GRILL JOINT

Robert I. Martin, Manheim, Pa., assignor to Rimar Manufacturing Inc., Manheim, Pa.

Continuation of Ser. No. 885,095, Dec. 15, 1969, abandoned.
This application Dec. 9, 1971, Ser. No. 206,531
Int. Cl. E04b *1/48*
U.S. Cl. 52—758 H **1 Claim**



A decorative window grill construction employing a plurality of interconnected, elongated grill bars of flattened construction to insert within the insulating space of an insulated window assembly and including connecting pins affixed at the free ends of the grill bars for insertion into undersized holes provided in the periphery of the insulated glass construction. The grill bars insert within axially aligned bores and distort portions of the internal grill bar construction. Grill bars forming diamond shaped configurations and having axially aligned central bores abut in angular relation by means of undersized bent pins which insert within the bores and restrict therein at the bent portions.

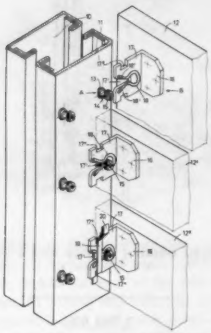
3,791,096
COUPLING UNIT FOR STRUCTURAL ELEMENTS

Helmut Epperlein, Dietersweiler, Germany, assignor to Christian Holzapfel K.G., Horb/Neckar, Germany

Filed Feb. 16, 1972, Ser. No. 226,685
Claims priority, application Germany, Oct. 6, 1971, 2149831
Int. Cl. F16b *1/00*
U.S. Cl. 52—758 C **6 Claims**

An angular first member is a bracket having two mutually inclined arms one of which can be fastened to a structural element and the other of which extends normal to it and has a free edge with a slot extending inwardly from the free edge and a pair of holes being formed in the region of the free edge at opposite lateral sides of the slot. A spring clip is provided on this other arm overlying the slot having a substantially circular

portion which encircles an inner end of the slot and two legs which extend in unbiased condition of the spring clip at 90° angle to the circular portion and whose free ends are received in the holes provided in the other arm, so that the legs are biased towards one another to some extent and their juncture with the circular portion defines a width or gap which is



somewhat narrower than the width of the slot. A second member is configurated as a bolt which can be secured to another structural element and whose shaft can be snapped into the circular portion of the spring clip; being retained therein by the legs of the spring clip in the region of their juncture. The shaft has a head which prevents its withdrawal in axial direction from the slot.

3,791,097

METHOD OF DETECTING AND REPAIRING A STRUCTURAL ROOF DAMAGED BY SUBSURFACE MOISTURE

John N. Cassella, Bloomfield Hills, and James J. Cavalier, Orchard Lake, both of Mich., assignors to The Tremco Manufacturing Company, Cleveland, Ohio

Filed Jan. 19, 1973, Ser. No. 325,025

Int. Cl. E04b *1/66*; **H01j** *31/50*

U.S. Cl. 52—741 **7 Claims**

A method under the title of the application, which involves generating an infrared image of a roof from an airborne position, from infrared radiation emitted by the roof in the spectral band from about 2 to about 14 microns, preferably from about 8 to 14 microns, thus locating roof portions corresponding to areas of anomalous radiation which are potentially moisture laden areas of the roof, and effecting repairs of those roof portions where the presence of subsurface moisture is confirmed by coring or other inspection procedures.

ERRATUM

For Class 52—79 see:
Patents Nos. 3,791,080 thru 3,791,082

3,791,098

METHOD OF MANUFACTURING A PRESSURIZED DISPENSING PACKAGE

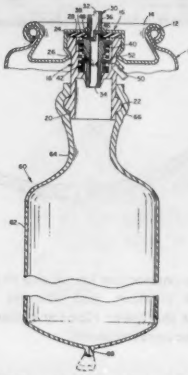
Milo E. Webster, Braintree, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Feb. 8, 1971, Ser. No. 113,545

Int. Cl. B65b *43/00*; **B29c** *17/07, 27/00*

U.S. Cl. 53—30 **10 Claims**

A pressurized dispensing package includes a rigid outer container and an inner container disposed within the outer container. The inner container is formed of a length of organic plastic tubing that has two discrete stable dimensional states. In forming the inner container, a portion of the tubing is disposed in a mold and expanded against the wall of the mold to form a thin walled body portion. A seal is formed in one end of the body portion and the other end of the tubing is secured



to a valve assembly by positioning that end over a stub of the valve assembly and heating that end portion to shrink it and form a firm mechanical joint. The inner container may have a dip tube in it secured to the bottom of the container, and in another embodiment, this tube extends entirely through the inner container.

3,791,099

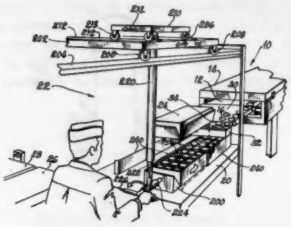
METHOD AND APPARATUS FOR PACKAGING ARTICLES

Richard C. Wagner, Clarendon Hills, Ill., assignor to Integral Process Systems, Inc., Park Forest, Ill.

Filed Apr. 6, 1972, Ser. No. 241,767

Int. Cl. B65b *5/00, 35/50, 67/00*

U.S. Cl. 53—26 **21 Claims**



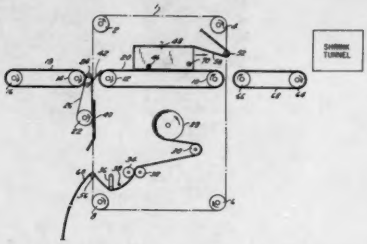
This application discloses a method and apparatus for stacking a plurality of articles in superposed relation and subsequently placing a plurality of full stacks of the articles into a container. The articles are initially moved in end-to-end relation in transversely spaced rows along a path and are dropped at the end of the path towards a lower support. An intermediate shuttle plate is positioned between the end of the path and the support to briefly interrupt the downward movement of the articles. The articles are then dropped and received on the support to form a stack in an area. The stacks of the articles are periodically moved along the support to a collection area. An open topped shovel is utilized to periodically remove a plurality of stacks from the support. The plurality of stacks on the shovel are then placed in a container with its top facing downwardly over the open topped shovel and thereafter rotating the shovel and container to place all of the stacks on the shovel into the container.

3,791,100

BUNDLING MACHINE AND PROCESS

Alfred C. Monaghan, Warren, N.J., assignor to Weldotron Corporation, Piscataway, N.J.

Filed Feb. 4, 1971, Ser. No. 112,616
Int. Cl. B65b *11/12, 41/12, 57/12*
U.S. Cl. 53—74 22 Claims



A bundling process and apparatus utilizes a conveying system which is coordinated with the movement of at least one wrapping bar for successively positioning one end of a length of enwrapping material in position on one end of an intermittently operated conveyor of the conveying system. An article to be wrapped is placed over the positioned end of the enwrapping material and then carried forward to rest fully on the conveyor, whereupon the conveyor stops. While the article is on the stationary conveyor, the wrapping bar travels a path encircling the conveyor and carries the opposite end of the enwrapping material around the article, positioning it so that as the article moves onto another conveyor of the system it laps the end positioned underneath the article, and the lap is then sealed and the enwrapping material heat shrunk to form a tight sleeve wrap or bundle.

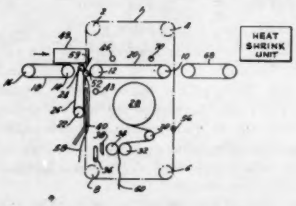
Means are provided for controlling the feed of the wrapping material from a continuous roll mounted beneath the conveying system, in the middle of the wrap bar travel path, for severing the proper length of material and for maintaining the leading end of the severed material in position on the end of the intermittent conveyor until the article is placed thereon.

3,791,101

PACKAGING MACHINE AND PROCESS

Alfred C. Monaghan, Warren, N.J., assignor to Weldotron Corporation, Piscataway, N.J.

Filed Apr. 20, 1971, Ser. No. 135,644
Int. Cl. B65b *11/12, 41/12, 49/16*
U.S. Cl. 53—210 4 Claims



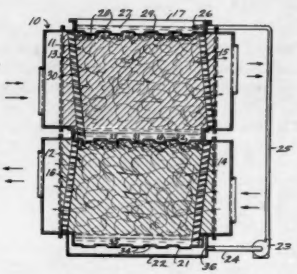
This invention relates to a bundling process and apparatus using a conveying system in which the leading end of a predimensioned sheet of wrapping material is advanced with the aid of an air jet to the input end of a conveyor, and supported by the air jet to lie in the path of an incoming article to be wrapped. The article supplied to the conveyor contacts, and proceeds to rest upon, the leading end of the sheet, and a wrapping bar then travels around the article carrying the trailing end of the sheet to form a sleeve around the article. This sleeve wrap is then completed by passing the article from the conveyor to another surface, causing the trailing end of the wrapper sheet to overlap the leading end underneath the article, and the overlapped ends are then heat sealed and the wrapping material heat shrunk to form a tight sleeve wrap.

3,791,102

MULTIPLE COMPARTMENT PACKED BED ABSORBER-DESORBER HEAT EXCHANGER AND METHOD

Richard L. Huntington, Rt. No. 1, Van Buren, Ohio

Filed June 10, 1971, Ser. No. 151,727
Int. Cl. B01d *47/14*
U.S. Cl. 55—32 7 Claims



The invention is a multiple compartment packed bed absorber-desorber heat exchanger. The absorber-desorber heat exchanger includes at least one set of upper and lower compartments containing suitable tower packing. Gas inlets, gas outlets and liquid distributors are provided for each packed bed chamber. The gas flows in the upper and lower compartments are isolated from each other by a liquid seal. The upper and lower packed beds are wetted by a common irrigation liquid or heat exchange fluid which gravitates downwardly through the packed beds to a sump and recycling pump. The dual packed beds can be operated to absorb and desorb gases, to concentrate gaseous contaminants, or to transfer heat and to condense vapors. Preferably, the dual packed bed chambers are of modular construction.

3,791,103

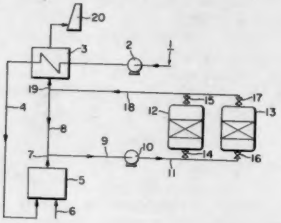
METHOD OF TREATING WASTE GAS ARISING FROM INDUSTRIAL FACILITY

Kazuto Kusano, and Kenji Miyata, both of Tokyo, Japan, assignors to Japan Gasoline Co., Ltd., Tokyo, Japan

Filed June 30, 1972, Ser. No. 268,158
Claims priority, application Japan, July 10, 1971, 46-51203
Int. Cl. B01d *53/04*
U.S. Cl. 55—73 6 Claims

A method of treating waste gas containing harmful components arising from an industrial facility by the use of a waste-gas treating equipment, which comprises the provision of an open bypass duct leading directly from the outlet for waste gas of the industrial facility to the exhaust system and a

duct equipped with a blower and a waste gas treating equipment which branches off said bypass duct to lead to the exhaust system, said blower working to pass at least the whole quantity of the waste gas generated in the industrial facility through said waste gas treating equipment.

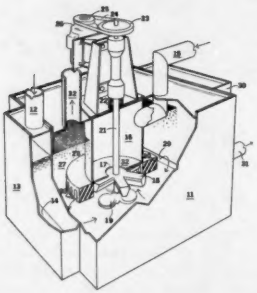


3,791,104

HIGH ENERGY GAS-LIQUID CONTACTING PROCESS

Jay B. Clitheroe, Salt Lake City, Utah, assignor to Mineral & Chemical Resource Company, Houston, Tex.

Filed June 26, 1972, Ser. No. 266,333
Int. Cl. B01d *47/02*
U.S. Cl. 55—86 **5 Claims**



Gases and liquids, with or without solids suspended in either phase, are contacted within a closed chamber at high shear energy and internally recirculated for repeated contact within the closed chamber. Gas-liquid interface surface area is increased, thereby increasing gas diffusion rate into the liquid and promoting absorption of constituents from the gas stream into the liquid medium or reaction of solids within the liquid medium with a gaseous constituent.

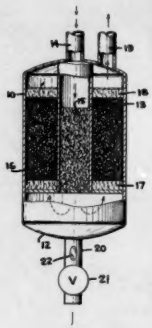
3,791,105

METHOD AND APPARATUS FOR SEPARATING OIL FROM A MIXTURE OF OIL AND A GASEOUS FLUID

Herbert M. Rhodes, New Orleans, La., assignor to Oil Mop, Inc., New Orleans, La.

Filed July 27, 1971, Ser. No. 166,459
Int. Cl. B01d *45/02*
U.S. Cl. 55—97 **2 Claims**

The present disclosure is directed to an oil filter for removing oil from a gaseous fluid in which the oil containing gaseous fluid is passed through two filter stages, the first of which is a medium packed petrophilic aerophobic hydrophobic material and the second stage is a densely packed filter media of the same material. The oil free gaseous fluid is removed from the top of the second stage while the oil is drained by gravity from the bottom of the second stage.

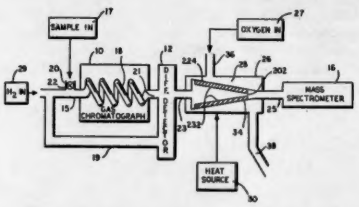


3,791,106

GAS ANALYSIS SYSTEMS AND PALLADIUM TUBE SEPARATOR THEREFOR

Floyd C. Haley, La Canada, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 852,825, Aug. 25, 1969,. This application Sept. 24, 1970, Ser. No. 75,278
Int. Cl. B01d *53/22*
U.S. Cl. 55—158 **2 Claims**



Sequential analytical determination of the composition of a vapor sample is performed by suspending the sample in a major amount of hydrogen carrier gas or a mixed carrier gas consisting of hydrogen and helium and passing the suspension through a gas chromatograph. More than 90 percent of the hydrogen carrier gas is removed from the effluent of the chromatograph by passing the effluent through a heated palladium tube before delivering to a detector such as a mass-spectrometer. Removal of the hydrogen portion of the carrier gas through the wall of the tube may be enhanced by providing an oxygen containing atmosphere at the outside surface of the tube.

3,791,107

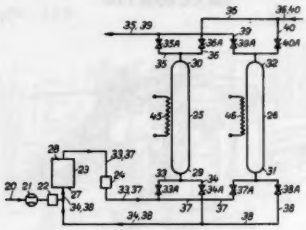
OFF-GAS SYSTEM FOR NUCLEAR REACTORS

Eric Borje Gustavsson, Vasteras, Sweden, assignor to AB Asea-Atom, Vasteras, Sweden

Filed Jan. 20, 1972, Ser. No. 219,373
Claims priority, application Sweden, Feb. 10, 1971, 1654/71
Int. Cl. B01d *53/04*
U.S. Cl. 55—179 **5 Claims**

An off-gas system for nuclear reactors includes a delay container to delay fission gases and two absorption units to absorb

fission gases. An openable and closeable connection is provided from the outlet of the delay container to each of the absorption units. Arrangements are provided by which gas may be furnished to one end of each absorption unit while this unit



is disconnected from the outlet of the delay container to pass through and regenerate the absorption unit and then to return to the delay container. This is done when the gas normally escaping from the absorber unit is found to contain fission gases.

3,791,108

FLOW-ACCELERATING NOZZLE FOR GAS SCRUBBER

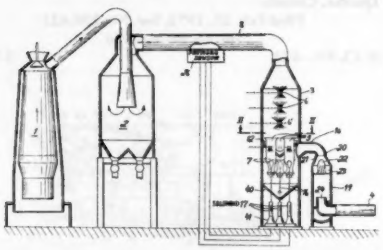
Gerhard Hausberg, and Karl-Rudolf Hegemann, both of Essen-Bergerhausen, Germany, assignors to Gottfried Bischoff Bau Kompl Gosreinigungs und Wasseruckkuhlanlagen KG, Essen, Germany

Continuation-in-part of Ser. No. 188,557, Oct. 13, 1971, Pat. No. 3,726,065. This application Mar. 16, 1972, Ser. No. 235,149

Claims priority, application Germany, Oct. 10, 1970, 2049902; Dec. 2, 1970, 20592000

Int. Cl. B01d *47/10*

U.S. Cl. 55—226 **6 Claims**



A washer for the scrubbing of flue gases contains one or more flow-accelerating nozzles with generally pear-shaped inserts vertically displaceable in a tubular housing to vary the width of an annular gap formed between the insert and the housing to give passage to a descending gas stream. The lower part of the housing is flared outwardly and provided with several spacedly nested, similarly flared sleeves forming therewith a plurality of annular exit channels around a central port accommodating a stem which supports the insert.

3,791,109

GAS CLEANING APPARATUS

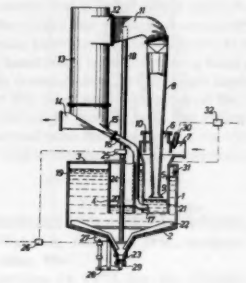
Karl Axel G. Gustavsson, Enkoping, Sweden, assignor to AB Bahco Ventilation, Enkoping, Sweden

Filed Sept. 7, 1971, Ser. No. 178,016

Claims priority, application Sweden, Sept. 7, 1970, 12115/70

Int. Cl. B01d *47/02*

U.S. Cl. 55—229 **3 Claims**



A gas cleaning apparatus is described having a common container for a liquid take-up zone and a sedimentation zone. The container is normally closed except for first and second casings which extend downwardly from the top of the container and have open lower ends. The first casing has a top open to the atmosphere and the second casing is an inlet chamber having its top portion connected to a conduit for gas to be cleaned. A vacuum maintained in the container causes liquid levels in the casings to be below a liquid level in the container. A vertically extending gas treatment passage has a lower end terminating above the liquid level of the liquid take-up zone in the second casing and the other end connected to a liquid droplet separator in turn connected to a suction fan to draw a mixture of liquid droplets and gas to be cleaned upwardly through the treatment passage into the droplet separator. The upper end of this passage is connected to the top of the container to maintain the vacuum in the container. Liquid separated in the droplet separator is returned by a conduit into the lower end of the second casing at a position spaced above the sedimentation zone so that any solids can settle as sludge in the container. Rotating scrapers driven by a shaft extending downwardly through the first casing move settled sludge toward a discharge valve at the lower end of the conical bottom. The valve is operated in response to the load on the motor to open the valve to discharge sludge. A level detector in the container controls the introduction of make-up liquid.

3,791,110

APPARATUS FOR PRODUCING GRANULAR SOLIDS FROM THE GASEOUS PHASE SUCH AS BY SUBLIMATION

Heinrich Klein; Rudolf Pieper, both of Erlangen, and Joachim Sieth, Essen, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

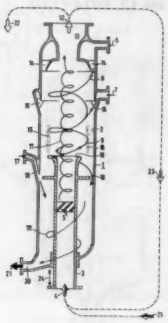
Filed June 17, 1971, Ser. No. 154,050

Int. Cl. B01d *45/12*

U.S. Cl. 55—261 **1 Claim**

Granular solids are produced (sublimated) from gaseous-phase substances entrained in a gaseous carrier medium. Applied for this purpose is a tornado flow constituted by an outer circulatory flow and an inner rotational (vortex-filament) flow in a cylindrical chamber. The substance to be sublimated, preferably entrained in a gaseous carrier medium, such as air, is introduced into the cylindrical chamber from an axial side thereof to form the inner rotational flow. An auxiliary medium, which may also be air, is supplied into the wall adjacent

region of the cylindrical chamber in a direction opposed to that of the rotational flow, so that the flow of auxiliary medium essentially consitutes the circulatory flow. The supply of auxiliary medium is kept at a temperature lower than that of the introduced flow of carrier medium. In the transitional region between the warmer rotational flow and the cooler circulatory flow there occurs a formation of the solids out of the gaseous-phase substance. The solids are discharged, preferably by entrainment in a branched-off portion of the circulatory flow, through an outlet surrounding the incoming flow of carrier medium.



3,791,111

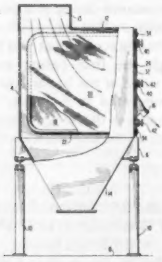
FILTER DEVICE

Gert Wolfgang Kroll, 18 Bayernstrasse, Hosel near Dusseldorf, Germany

Continuation-in-part of Ser. No. 77,651, Oct. 2, 1970, abandoned. This application Apr. 30, 1973, Ser. No. 355,451

Int. Cl. B01d *46/02*

U.S. Cl. 55—341 **3 Claims**



A gas filtering device in which a series of filter units are arranged parallely within a housing. Each filter unit comprises a frame about which fabric filter is wrapped to form parallel sides, thereby providing a filter pocket. The filter units are inserted into a casing through slots in a casing wall. The free edge of the filter fabric is wound around a sealing ring so as to form a welt. A sheet metal cover strip closes the open front side of each frame, clamps the welt against the casing wall at the slot edges, and this cover has a tubular connector disposed outside of the housing and affording sole access to the filter pocket.

3,791,112

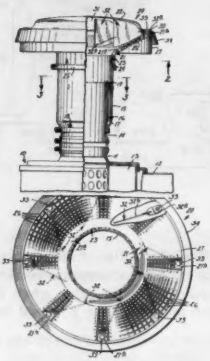
MOISTURE REMOVING STACK CAP FOR ENGINE AIR INTAKES

James E. Lidstone, St. Louis Park, Minn., assignor to Donaldson Company Inc., Minneapolis, Minn.

Filed Sept. 23, 1971, Ser. No. 182,962

Int. Cl. B04c *3/06*

U.S. Cl. 55—385 **7 Claims**



A centrifugal separator is shown, including a collector tube that is large enough to fit over the top end of a vertically extending engine air intake stack to provide a moisture collecting chamber between the walls of the stack and tube; a stack cap base member with a central opening connected to the tube and walls with air intake openings therein flaring outwardly from the central opening; a cover member mounted over the base member to form a chamber therebetween; and a plurality of spaced, tangentially directed vanes mounted in the chamber between the intake openings and central opening.

3,791,113

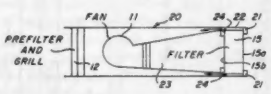
SEALS FOR AIR FILTERS

Robert Arnold Elder, 106 Edgewood Dr., Chateauguay Centre, Quebec, Canada

Filed Feb. 29, 1972, Ser. No. 230,422

Int. Cl. B01d *46/10*

U.S. Cl. 55—473 **2 Claims**



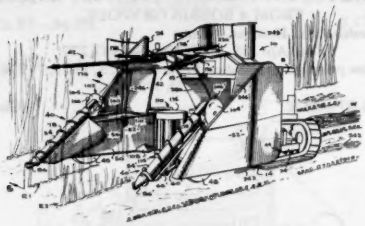
An air filtering device for clean air particularly for systems for use in "clean rooms". One of the problems existing with devices of this nature has been that when small leaks develop at the bonded joints, contaminated air enters the clean area. The present invention seeks to overcome this disadvantage by causing any leaks, which do occur, to be away from the clean area rather than into it. The invention provides a device having an outer chamber with an air filter therein; sealing means between one face of the filter and the chamber; a plenum chamber and sealing means between the other face of the filter and the plenum chamber. A fan is operatively connected to the plenum chamber and is adapted to move air to be filtered across the filter through the faces thereof.

3,791,114

TWO ROW CUTTER WINDROWER HARVESTING MACHINE

Larry G. Fowler, Belle Glade, Fla., assignor to Sugar Cane Growers Cooperative of Florida, Belle Glade, Fla.

Filed May 18, 1972, Ser. No. 254,372
Int. Cl. A01d *45/10*
U.S. Cl. 56—13.9 29 Claims



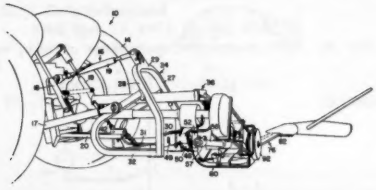
A sugar cane harvesting machine is disclosed including a tracked vehicle on which two identical row harvesting means are provided for two adjacent rows with the harvesting means including a lower cane chopper for chopping the cane of the row at ground level, a cane lifting and guiding scroll means for lifting fallen cane toward a vertical position and cutting tangles or mats incapable of vertical orientation to prevent uprooting of such cane forwardly of the lower cutting means, upper guide chains for guiding the tops of the vertically oriented cane to a cane top cutter where the tops are cut and guided to fall beneath the tracks of the vehicle; the lower cane cutting means includes kicker rolls operative to deflect the severed cane into an inverted U-shaped orienting chute in which the cane is oriented parallel to the rows with the cane from both rows being formed into a single windrow between the two rows being harvested.

3,791,115

TRACTOR-MOUNTED MOWER

Arlyn Ray Nelsen, and Wilfred LeeRoy Steuerwald, both of Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.

Filed July 6, 1972, Ser. No. 269,344
Int. Cl. A01d *55/28*
U.S. Cl. 56—15.2 28 Claims



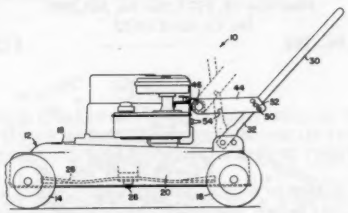
A three-point hitch-mounted mower has a main frame that is mounted on and vertically adjustable with the tractor hitch. A generally fore-and-aft subframe is swingably mounted on the main frame on a transverse pivot, and the forward end of the subframe is connected to the tractor drawbar so that the rearward end of the subframe raises at a more rapid rate than the main frame. A transversely extending drag bar is universally pivoted to the main frame and carries a yoke at its outer end, a mower driving head being pivotally connected to the yoke for swinging about a fore-and-aft axis. A transversely extending cutter bar extends outwardly from the driving head and is driven thereby, and the driving head is connected to the rearward end of the subframe by a chain which causes the driving head to rock and thereby raise the cutter bar as the subframe raises, the chain having a predetermined amount of slack when the cutter bar is in operating position to allow the outer end of the cutter bar to float downwardly. A tension spring also extends between the rearward end of the subframe and the driving head offset from the driving head pivot, so that the spring partly counterbalances the weight supported on the mower shoes at the inner and outer ends of the cutter bar, a chain being mounted in parallel with the spring to limit the spring extension and raise the inner end of the cutter bar after the main frame and subframe raise a predetermined amount.

3,791,116

HANDLE SUPPORT FOR A WALK-BEHIND MOWER

Lloyd Arnold Wykhuis, Mayville, Wis., assignor to Deere & Company, Moline, Ill.

Filed May 14, 1973, Ser. No. 359,862
Int. Cl. A01d *35/26*
U.S. Cl. 56—17.5 6 Claims



A walk-behind rotary mower includes a stamped sheet metal deck on the top central portion of which is mounted a motor for driving the mower blade. A handle is pivotally connected to a rear portion of the deck and is supported by means of a pair of rearwardly extending support arms which are pivotally connected to the opposite ends of a transverse bracket fixed to the rear side of the motor.

3,791,117

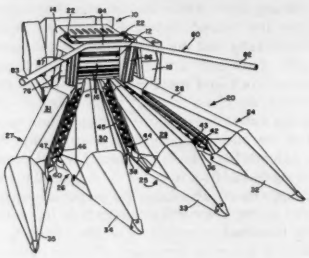
ROW CROP HARVESTER ATTACHMENT

Allan Keith Lawrence, Ottumwa, Iowa, assignor to Deere & Company, Moline, Ill.

Filed July 24, 1972, Ser. No. 274,632
Int. Cl. A01d *45/02*
U.S. Cl. 56—98 3 Claims

A three-row row crop harvesting attachment for a forage harvester has three generally fore-and-aft passages which receive three rows of row-planted crops as the machine advances, a cutting apparatus being provided at the forward end of each passage for severing the crop from the field. A pair of gathering devices are disposed along opposite sides of each passageway and move the stalks upwardly and rearwardly to the crop inlet on the forage harvester. Each gathering device includes an endless chain trained around front and rear sprockets and having belt-like loops which extend into the passageway and intermesh with the loops in the opposite gathering device to grasp the stalks of the crop, the rear sprockets for the center pair of gathering devices being disposed above the level of and forwardly of the other rear sprockets. A pair of rollers extend upwardly from the rearward end of the fenders overlying the outer two gathering

devices and are respectively coaxially connected to the outer rear sprockets, so that the inner peripheries of the rollers engage the crop in the outer two passageways to assist in the con-



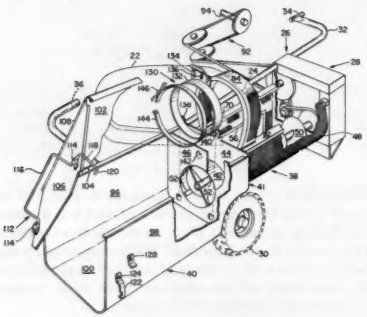
vergence of the crop into the inlet opening. A pair of generally horizontal forwardly diverging arms extend forwardly from the upper ends of the rollers to guide the upper portions of the stalks.

3,791,118

COMPACTOR ATTACHMENT FOR A LAWN MOWER

Robert Nick Behrens, Horicon, Wis., assignor to Deere & Company, Moline, Ill.

Filed May 18, 1973, Ser. No. 361,499
Int. Cl. A01d *38/22*
U.S. Cl. 56—202 **8 Claims**



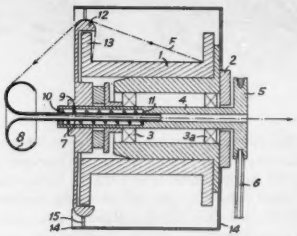
A lawn and garden type tractor has a belly-mounted rotary lawn mower with a side discharge opening communicating with an inlet opening at the lower inner side of a fore-and-aft elongated, material-receiving housing or housing section extending longitudinally alongside the tractor. A substantial portion of the walls of the material-receiving section are foraminous so as not to impede the flow of air created by the cutting blade or blades of the mower and the material-receiving housing is large enough so that material entrained in the flow of air from the mower will be temporarily suspended therewithin before falling onto an auger which is rotatably mounted in the bottom and projecting from the rearward end thereof into a tubular member forming part of an intermediate housing or housing section, the tubular member opening into a relatively large compaction housing or housing section of the structure. The compaction housing is adapted to support a plastic bag or the like in a position with its open end in material-receiving relation to the outlet of the tubular member through means of a removable mounting ring assembly, the bag when so positioned being operable for having material compacted therein by the auger. Once a bag is filled with compacted material, it may be removed from the enclosure and replaced by an empty bag. The housings form part of a unitary structure which is supported on a single ground wheel located at the outer side of the structure and the structure is pivotally connected to the tractor by means permitting it to follow undulations of the ground and move vertically relative to the tractor.

3,791,119

DEVICES FOR UNWINDING FILAMENTARY MATERIAL FROM A BOBBIN OR SPOOL

Jean Godderidge, Houilles, France

Filed Apr. 25, 1972, Ser. No. 247,277
Claims priority, application France, Nov. 5, 1971, 7117034
Int. Cl. D01h *7/00*
U.S. Cl. 57—34 R **4 Claims**



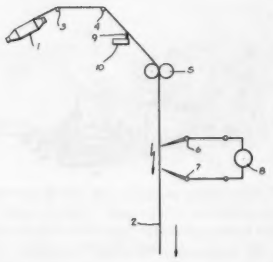
This invention relates to devices for unwinding filamentary material from a bobbin or spool. The bobbin or spool has at least one cheek and a rotatable capping flange surrounds this cheek: a tube is located at the centre of the bobbin or spool and has a flared end, and means are provided for rotating the central tube and the capping flange together. As a result of the apparatus, the filamentary material may be taken off the bobbin or spool, be passed over the flared end of the central tube and along the latter and out of its other end.

3,791,120

APPARATUS FOR HEATING OF ENDLESS FILAMENTS, YARNS OR THE LIKE

Leodegar Hess, Wattwil, Switzerland, assignor to Heberlein & Co. A.G., Wattwil, Switzerland

Filed Sept. 21, 1972, Ser. No. 290,849
Claims priority, application Switzerland, Sept. 21, 1972, 13744/71
Int. Cl. D02g *1/02*; **D01h** *13/28*
U.S. Cl. 57—34 HS **16 Claims**



Apparatus for heating yarns of indefinite continuous length as the yarn advances longitudinally comprises as arc discharge device positioned in the vicinity of the yarn or in contact therewith so that the arc follows the yarn or passes through same. Means may also be provided to moisten the yarn with a conductive fluid before the arc is applied.

3,791,121

APPARATUS FOR TEXTURING OR DRAWING AND TEXTURING SYNTHETIC YARNS

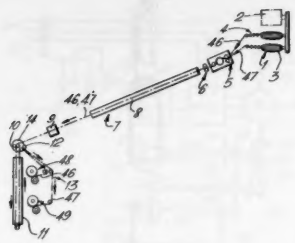
Walter Ernst, Guttingen, Thurgau, Switzerland, assignor to Ernest Scragg & Sons Limited, Macclesfield, England

Filed June 19, 1972, Ser. No. 264,129

Claims priority, application Germany, June 19, 1971, 2130551

Int. Cl. D02g *1/02*

U.S. Cl. 57—34 HS 8 Claims



Apparatus for texturing synthetic thermoplastic yarn is in the form of a self-contained machine unit comprising a long straight support spline with which a drive transmission shaft is co-extensive, the spline carrying at least one set of yarn feed rolls, a heater and a yarn texturing mechanism. The feed rolls are at one end of the spline and drivably connected to the transmission shaft, and at the other end of the spline a belt pulley also connected to the shaft can be belt coupled to a drive motor individual to the machine unit. Multiple machine units can be mounted in inclined spaced parallel disposition on a framework, as a horizontal row, to build a machine. The framework supports the motors for the machine units, and also optional setting apparatuses and winding assemblies associated with the machine units to form production units. Detachable spline extensions carry further feed rolls for cooperation with the first feed rolls for drawing yarn prior to texturing.

3,791,122

FALSE TWIST PROCESS AND APPARATUS

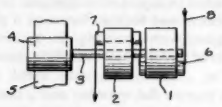
Josef Raschle, Butschwil, Switzerland, assignor to Heberlein & Co. AG, St. Gall, Switzerland

Filed Mar. 15, 1972, Ser. No. 234,777

Claims priority, application Switzerland, Mar. 18, 1971, 4031/71

Int. Cl. D01h *7/92*; D02g *1/04*

U.S. Cl. 57—77.45 13 Claims



Yarn to be texturized by false twist is passed axially and sequentially through tubes, the input and output angles of the yarn in respect of the tube axes totaling between 300° and 600°.

3,791,123

METHOD AND APPARATUS FOR REPLACING BOBBINS ON SPINNING OR TWISTING MACHINES

Yoshikazu Kawauchi, Aichi-ken, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya-shi, Japan

Filed Nov. 24, 1971, Ser. No. 201,814

Claims priority, application Japan, Nov. 27, 1970, 45/104982; Dec. 11, 1970, 45/110822

Int. Cl. D01h *9/08*

U.S. Cl. 57—52 6 Claims

A method of and apparatus for simultaneous doffing full packaged bobbins from respective spindles and donning fresh bobbins on the empty spindles of a spinning or twisting machine. This doffing and replacing operation is carried out by gripping the head of each bobbin by means of bobbin gripping members disposed on a horizontal holding bar which can be displaced upward or downward parallel to the spindle rail of the spinning or twisting machine.

3,791,124

METHOD AND APPARATUS FOR CONTROLLING THE DOFFING OF BOBBINS AND THE DONNING OF TUBES ON SPINDLES OF RING SPINNING AND RING TWISTING MACHINES

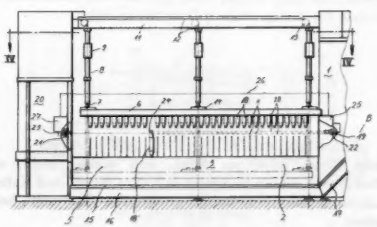
Siegfried Kaufmann, and Hans Rutz, both of Winterthur, Switzerland, assignors to Rieter Maschine Works, Ltd., Winterthur, Switzerland

Filed June 12, 1972, Ser. No. 263,754

Claims priority, application Switzerland, June 18, 1971, 8896/71

Int. Cl. D01h *9/00*, *13/14*

U.S. Cl. 57—52 21 Claims

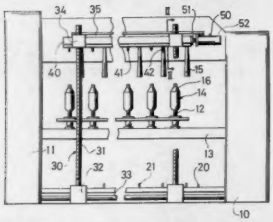


A light source is positioned to direct a beam of light on a receptor on a straight line axis located above the row of spindles but within the contour of the tubes mounted on the spindles. After doffing, the light source is turned on to detect the presence of undoffed tubes or the presence of a spindle which may have been torn up during doffing. If the beam of light is interrupted, donning of fresh tubes can be prevented until the spindles are cleared.

3,791,125
SPINNING MACHINE YARN PACKAGE TUBE EXCHANGING DEVICE

Hajime Kawakami, Hyogo-ken, Japan, assignor to Nippon Keori Co., Ltd., Kobe, Japan

Filed May 3, 1972, Ser. No. 250,027
Claims priority, application Japan, May 10, 1971, 46-31378
Int. Cl. D01h *9/08, 9/18*
U.S. Cl. 57—52 **5 Claims**



A device for removing fully wound yarn packages including the associated tubes from the spindles of a spinning machine and replacing the full packages with new empty tubes comprises, a conveyor for feeding the empty tubes outwardly along the longitudinal length of a spindle rail which has a plurality of longitudinally spaced spindles thereon. The device includes a vertically arranged threaded spindle of a transport member, which is engaged with a nut portion of a carriage which moves vertically and which carries a rail which is shiftable horizontally. The rail has a plurality of first gripper elements which are alternately spaced with second gripper elements and which depend therefrom and which may be aligned first with the new tubes which are delivered outwardly by the conveyor to engage the first gripper elements with the tubes. The carriage is then elevated to position the new tubes over the spindles and to align the second gripper elements with the spindles. The carriage is subsequently moved downwardly to engage the second gripper elements with the full tubes on the spindles and to remove them by lifting them upwardly. The rail may be shifted horizontally to then align the new tubes vertically over the spindles which are now empty, and the carriage is again movable downwardly to position the new tubes in place. The fully wound tubes are then delivered back to the conveyor for transport away from the spindles.

3,791,126
AUTOMATIC DOFFING APPARATUS

Tatsuo Kose; Kiyokazu Hori, and Kazuo Ochi, all of Wakayama, Japan, assignors to Daiwa Boseki and Kabushiki Kaisha Toyoda Jidoshokki, Seisakusho, Kariyashi, both of, Japan

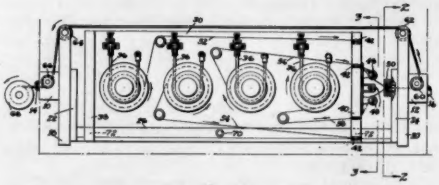
Filed May 28, 1971, Ser. No. 147,814
Claims priority, application Japan, June 1, 1970, 45-47776; June 10, 1970, 45-53931
Int. Cl. D01h *9/10, 1/12*
U.S. Cl. 57—53 **14 Claims**

An automatic doffing apparatus adapted for use with an open end spinning machine having a plurality of spinning units arranged in side-by-side relation, for doffing full packages one by one from the respective spinning units during operation of the spinning machine while travelling along the front face of the spinning machine. The apparatus comprises a rotary doffer for disengaging the full package from a traversing roller, domounting the full package from a bobbin holder and then mounting an empty bobbin in the bobbin holder; and a cutting and suction device for cutting a spun yarn between the traversing roller and a take-up roller and lapping one of the cut yarn ends around the empty bobbin.

3,791,127
WIRE TWISTING MACHINE

Marshall F. Wesson, Auburn, Mass., assignor to James Smith & Son, Inc., Worcester, Mass.

Filed Apr. 24, 1972, Ser. No. 246,885
Int. Cl. D07b *3/12;* **D01h** *7/86*
U.S. Cl. 57—58.52 **6 Claims**



A frame for a creel, the frame comprising an elongated slotted bar suspended on a pair of oscillatable arms depending from coaxial supports and located between a pair of spaced flier arms, and aligned with a twisting die, in combination with a new and improved creel which is easily mounted and abstracted from the creel frame, said creel comprising a generally upright narrow flat member and a disc at each end, the flat creel member having on each side thereof a plurality of spool holders, and guides for the wire from the spools directed to one of the flier arms over sheaves on one of the creel end discs, and through the die where the twisting occurs, the flier arms being rapidly rotated on the axis of the die and of the creel, and means leading the twisted wire longitudinally reversely across the creel to a sheave on the axis of the other flier arm and thence to an external takeup reel or spool.

3,791,128
METHOD AND APPARATUS FOR STOPPING AND STARTING ONE OR MORE OPEN-END-SPINNING DEVICES

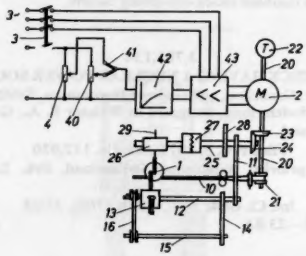
Hans Landwehrkamp, Gerolfing, and Heinrich Niestroj, Ingolstadt, both of Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Germany

Filed Nov. 18, 1971, Ser. No. 200,024

Claims priority, application Germany, Nov. 28, 1970, 2058604; June 21, 1971, 2130669

Int. Cl. D01h *1/30, 1/34, 1/12*

U.S. Cl. 57—93 **8 Claims**



Yarn breakages or irregularities are avoided by connecting spinning apparatus, fiber sliver supply devices, and yarn drawoff devices by suitable mechanical connections to a common variable speed motor to maintain a constant speed ratio between such components of spinning apparatus. A plurality of spinning apparatuses may have individual drive motors connected electrically to the common motor. Interposed between the main operating switch and the drive motor are a pair of intermediate circuits, one circuit having a potentiometer control to limit the motor to a low variable speed range, and the second circuit having relatively high speed range including normal production speed. Selector switches cooperate to connect the drive motor to one or the other of the intermediate circuits, but one or more of such selector switches may be operable manually or by cam control drums to effect switching from one intermediate circuit to another to effect low speed operation for an indefinite or a predetermined time to facilitate bobbin-changing or return of an escaped yarn end, for example.

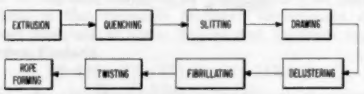
3,791,129
ROPE AND ITS MANUFACTURE

Abner P. Shuford, Hickory, N.C., assignor to Shuford Mills, Inc., Hickory, N.C.

Filed Sept. 3, 1971, Ser. No. 177,784

Int. Cl. D02g *3/06*

U.S. Cl. 57—140 R **4 Claims**



Rope having improved working qualities and hand without need to contain sizing or lubricants consists of a plurality of strands of fibrillated polyolefin film having a delustered surface. The film is delustered by surface abrasion prior to fibrillation and twisting into strands. Such rope exhibits low internal friction producing its good working qualities and low abrasion to objects in which it comes in contact producing its improved hand.

3,791,130
METHOD FOR FALSE-TWISTING A SYNTHETIC FILAMENT YARN

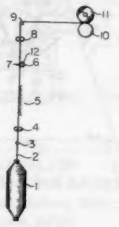
Hisao Inuyama, Otsu; Sadao Tomioka, Kusatsu, and Yoshihiko Chiba, Kyoto, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Oct. 28, 1971, Ser. No. 193,331

Claims priority, application Japan, Nov. 4, 1970, 45-96965; Nov. 4, 1970, 45-96966

Int. Cl. D02g *1/02*

U.S. Cl. 57—157 TS **7 Claims**



In the method, the yarn is heated at a temperature at which the yarn is plasticized. The yarn is then passed through a closed path formed around a pin while contacting the periphery of the pin. A portion of the yarn emerging from the closed path is brought into contact with a portion of the yarn entering the closed path. The entering and the emerging portions of the yarn are entwined with each other at entry and exit regions of the closed path in such a manner that each portion of the yarn goes around the other in at least one turn under friction while travelling in the same direction.

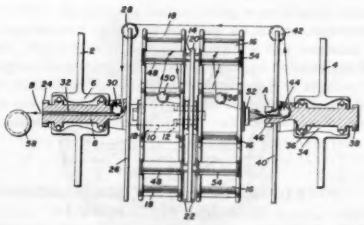
3,791,131
METHOD OF MAKING A CONCENTRIC WIRE ROPE ON A DOUBLE TWIST STRANDER

Roger M. Scott, Worcester, and Marshall F. Wesson, Auburn, both of Mass., assignors to Morgan Construction Company, Worcester, Mass.

Filed Mar. 27, 1972, Ser. No. 238,391

Int. Cl. D07b *3/00*

U.S. Cl. 57—161 **5 Claims**



The method of making a concentric wire rope on a double twist strander in which the rope is comprised of outer strands and a core strand and in which the lay of the wires of the outer strands is opposite the lay of the wires of the core strand and in the finished rope the length of the lay of the wires of the core strand has been shortened and the length of the lay of the wires of the outer strands has been increased.

3,791,132

PROCESS FOR SIZING TEXTILE FIBRES

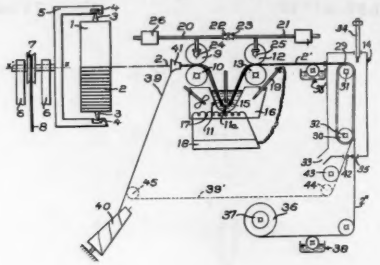
Richard Adrien Schutz, and Pierre Elisee Exbrayat, both of Mulhouse, France, assignors to Centre Technique Industriel: Institut Textile De France, Boulogne Sur Seine, France

Filed Dec. 1, 1971, Ser. No. 203,720

Claims priority, application France, Dec. 3, 1970, 7043555

Int. Cl. D02g *3/36*

U.S. Cl. 57—164 **8 Claims**



Process for sizing slivers or rovings of textile fibres in which the slivers or rovings are unwound from a supply thereof and are accelerated progressively and smoothly to a given speed by a pulling force which is always less than the cohesion force between the fibres constituting the slivers or rovings. The slivers or rovings are then flattened by passing between a first pair of pressure rollers, before dipping into a bath of size and then passing through a second pair of pressure rollers to be forwarded onto a drier for drying the size whereafter they are wound up on a bobbin. The size has the effect of gluing the fibres of slivers or rovings together and imparts sufficient cohesion for the slivers or rovings to be worked as such in a loom or knitting machine. The size may subsequently be removed after manufacture of a textile article from the slivers or rovings.

3,791,133

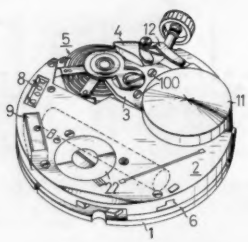
CRYSTAL OSCILLATOR TYPE SMALL TIMEPIECE

Takashi Hashimura, Saitama-ken; Akira Nikaido; Isao Koyama, both of Tokyo; Hisao Wakabayashi, Saitama-ken, and Hideki Ohuye, Tokyo, all of Japan, assignors to Citizen Watch Company, Limited, Tokyo, Japan

Filed June 22, 1972, Ser. No. 265,180

Int. Cl. G04c *3/00*

U.S. Cl. 58—23 AC **8 Claims**



A small electronic timepiece is disclosed, especially a watch, comprising a piezo-electric crystal oscillator as a time base means thereof, a frequency divider for dividing the oscillation fed from the oscillator, and a balance wheel motor for conversion of the frequency divided electric signal fed from the divider into a corresponding mechanical oscillative movement for driving a time-keeping gear train of the timepiece. The improvement of the timepiece comprises the oscillator comprising a piezoelectric oscillation crystal bar which is suspended in the interior of a totally enclosed and evacuated cylindrical container by suspension means at a position along its length defining a nodal point near at least one of the ends of the bar. The suspension means comprises at least two wire mounts each of which is formed at its intermediate portion into a shock-absorbing coil and suspended between two of four rigid supporting pillars fixedly mounted in the container, on the one hand, and the crystal bar, on the other hand. The container is mounted through a resilient sleeve tightly covering substantially the whole length of the container, thereby providing a doubled shock-absorbing means.

3,791,134

TIMEPIECE HAVING A NUCLEAR POWER SOURCE

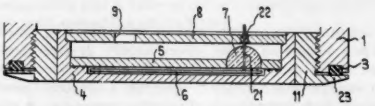
Karl Adler, Grenchen, and Georges Ducommun, Feldbrunnen, both of Switzerland, assignors to Biviator S. A., Grenchen, Switzerland

Filed Feb. 8, 1971, Ser. No. 112,920

Claims priority, application Switzerland, Feb. 23, 1970, 2551/70

Int. Cl. G04c *3/00*; **G04b** *37/00, 37/08*

U.S. Cl. 58—23 BA **5 Claims**



A timepiece comprising a nuclear power source in a capsule having a sensitive insulation of an output terminal, this insulation and output terminal respectively being protected by a protecting plate forming an intermediate back.

3,791,135

CASE WITH FLUID-TIGHT CLOSURE DEVICE

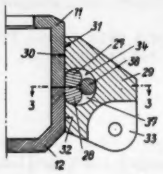
Bernard Taubert, 27 Chemin Sous-Caran, 1222 Vesenaz, Switzerland

Filed May 28, 1973, Ser. No. 364,653

Claims priority, application Switzerland, June 19, 1972, 9147/72

Int. Cl. G04b *37/08*

U.S. Cl. 58—90 R **5 Claims**

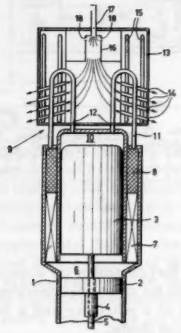


A case, e.g., a watch case, includes two case parts and two slide-operated devices for gripping together the case parts thereby deforming a packing ring to ensure fluid-tight closure of the case. Each device includes rail-forming elements disposed facing one another on the peripheries of the respective case parts, and a slide piece including a channel which straddles and slidably engages about the adjacent elements. The rail-forming elements are part cylindrical and include opposed convex surface portions against which oblique surfaces of said channel contact to wedge the case-parts together.

3,791,136
HOT-GAS ENGINE

Roland Anton Johan Otto Van Witteveen, and Gregorius Theodorus Maria Neelen, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Phillips Corporation, New York, N.Y.

Continuation of Ser. No. 26,639, April 8, 1970, abandoned.
This application Oct. 14, 1971, Ser. No. 189,336
Claims priority, application Netherlands, Apr. 18, 1969, 6906103
Int. Cl. F02g *1/04*
U.S. Cl. 60—24 8 Claims



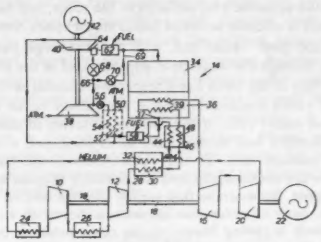
A hot-gas engine to which thermal energy is supplied by means of a heating system, which conducts a flow of heated medium along the heater and in which the heater is formed by a first wreath of pipes which communicate at their one end with the expansion space and at their other and communicate with further pipes which communicate with the regenerator and in which the further pipes are situated at least partly within a container in which a substance or a mixture of substances is present in which sensible and/or melting heat can be stored, the container comprising, in the zone over which the further pipes extend within the container, a number of ducts through which the heating medium flows away after passage of the first wreath of pipes.

3,791,137
FLUIDIZED BED POWERPLANT WITH HELIUM CIRCUIT, INDIRECT HEAT EXCHANGE AND COMPRESSED AIR BYPASS CONTROL

Albert Jubb, Kenilworth, and David Eyre Williams, Rugby, both of England, assignors to The Secretary of State for Defense in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed May 15, 1972, Ser. No. 253,023
Int. Cl. F02c *1/04*, *3/00*
U.S. Cl. 60—39.18 R 10 Claims

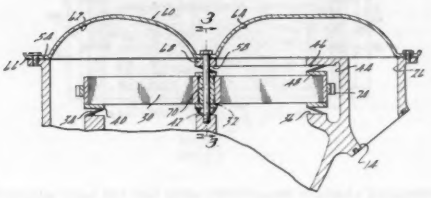
A power unit consists basically of two gas turbine engines. In the first which is a closed cycle the working fluid (helium) is heated by passing it through a duct embedded in a fluidized bed. The exhaust gas is passed through a conventional heat exchanger before being returned to the compressor. In the second engine, consisting of a compressor and a turbine, air from the compressor is passed through the particulate material of the fluidised bed with fuel which maintains combustion in the fluidised bed. The exhaust gas from the turbine of the second engine is passed through a conventional heat exchanger and then to atmosphere. The two engines each drive an alternator.



3,791,138
GAS TURBINE ENGINE REGENERATOR

Thomas R. Stockton, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed June 19, 1972, Ser. No. 263,829
Int. Cl. F02c *7/10*; F28d *19/04*
U.S. Cl. 60—39.51 H 6 Claims



A heat regenerator system for a gas turbine engine comprising a main turbine housing adapted to enclosed the power turbine wheel and the compressor drive wheel, a cylindrical regenerator core having axial gas flow passages mounted for rotation about a vertical axis in the upper region of the housing, a regenerator cover in the housing defining a high pressure regenerator inlet chamber in communication with the outlet side of the compressor, a generally circular lower seal surface formed in the housing in registry with a lower peripheral seal for the regenerator core, an arcuate enclosure formed within the housing for receiving a peripheral portion of the regenerator core and forming an upper regenerator core seal support surface surrounding the low pressure exhaust region for the regenerator core and an exhaust gas flow passage formed in the housing and adapted to receive low pressure exhaust gases directed by the regenerator cover from the regenerator core exhaust region.

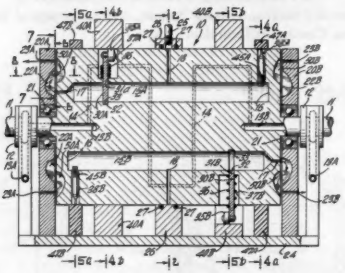
3,791,139
TURBINE ENGINE WITH VALVED, ROTATING COMBUSTION CHAMBER

Leon Simons, New City, N.Y., assignor to N & S Co., Southfield, Mich.

Filed Dec. 26, 1972, Ser. No. 318,285
Int. Cl. F02c *3/16*
U.S. Cl. 60—39.34 10 Claims

The engine includes a rotatably supported, axially elongated cylindrical rotor formed with a plurality of equiangularly spaced axially elongated chambers all located at the same radial distance from the rotor axis. Each chamber has a closed inner end and an outer end connected to a respective

discharge passage extending through an axial end surface of the rotor. Alternate chambers communicate with one axial end surface of the rotor and intermediate chambers communicate with the opposite axial end surfaces. A pair of stators engage the opposite end surfaces of the rotor, and each is provided with a circular series of radial stator vanes communicating, at the inner radial end, with the discharge passages extending through the respective adjacent end of the rotor. Each end surface of the rotor has a respective circular series of radial rotor vanes communicating at their inner radial ends with the outer radial ends of the associated series of stator vanes. Each chamber has, substantially at its midpoint, a radial fuel supply passage and, as the rotor rotates, the fuel supply passages are sequentially and successively aligned with a fuel supply pipe. Between its fuel supply passage and its discharge passage, each chamber has associated therewith a respective gate which is spring biased to an open position completely clearing the associated chamber and is operable, by a ring cam surrounding the rotor, to be moved to a position closing the



associated chamber immediately after fuel has been supplied to the chamber. Adjacent its inner end, each chamber has associated therewith an ignition device, such as a spark plug, which, as the rotor turns, engages an electrical contact to ignite the fuel mixture then in the associated chamber shortly after the associated gate has closed. Following the ignition, the ring cam permits the associated gate to open to that the combustion gases are discharged through the discharge passages into the stator vanes, to propel the rotor by reaction, with the combustion gases being redirected into the rotor vanes to provide a further rotor propelling action and with the combustion gases then being discharged from the radially outer ends of the rotor vanes through discharge passages extending through the stators. The engine is particularly designed for use with a metallic fuel, such as pure metallic dust or a catalyzed metal fuel, with the metallic dust being preferably suspended in a gel which immediately liquifies in the combustion chamber to form a fuel in addition to the metal powder.

3,791,140

OPERATION OF HYBRID ROCKET SYSTEMS

Thomas P. Rudy, and Raymond J. Muzzy, both of Saratoga, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 12, 1972, Ser. No. 252,692
Int. Cl. C06d *5/10*
U.S. Cl. 60—207 **4 Claims**

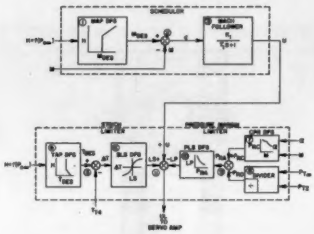
In the operation of a hybrid rocket system, a solid fuel consisting essentially of a polybutadiene, trimethylolpropane trimethacrylate, polymethylmethacrylate and an organic peroxide is burned in a combustion zone in the presence of an oxidizer that is supplied to the zone at varying flow rates. Because the solid fuel burns without char formation at low oxidizer to fuel ratios, it is possible to operate the system over a wide thrust range.

3,791,141

RAMJET ENGINE FUEL CONTROLLER

John E. Bush, and Leland M. Horgan, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 2, 1972, Ser. No. 294,049
Int. Cl. F02k *7/10*
U.S. Cl. 60—243 **3 Claims**



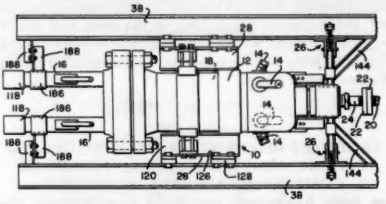
A ramjet engine fuel controller for automatically giving the desired fuel/air ratio for all engines operating conditions. The controller consists of a scheduler and a limiter. The entire system is electronic or fluidic.

3,791,142

FLUID-POWERED ENGINE

Antonio Caldarelli, Apt. 29 Clinton Manor, 281 W. Clinton St., Dover, N.J.

Filed Sept. 14, 1972, Ser. No. 289,002
Int. Cl. F02k *11/00;* **F02c** *7/20*
U.S. Cl. 60—263 **10 Claims**

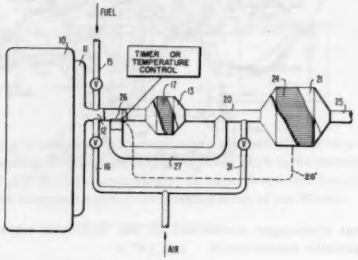


The engine, in one embodiment thereof, comprises an impulse velocity, staged turbine operative under the influence of energized fluid to provide thrust, or rotary torque, or both. Ancillary fluid admitting means are provided to enhance thrust or to depressurize the plenum chamber/exhaust space of the engine so that the engine can function with a low pressure-differential with respect to the inlet and outlet thereof. The turbine is coupled to a housing and frame in a manner accommodating for thermal expansion thereof relative to the housing and frame. Downstream of the turbine, straight exhaust pipes or nozzled exhaust pipes are through connected with the plenum chamber/exhaust space for venting expanded fluid from the turbine.

3,791,143
PROCESS AND APPARATUS

Carl D. Keith, Summit, and John J. Mooney, Wyckoff, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Murray Hill, N.J.

Filed Nov. 10, 1971, Ser. No. 197,348
Int. Cl. F01n 3/14
U.S. Cl. 60—274 **20 Claims**

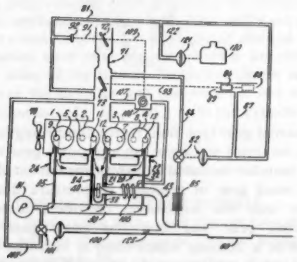


There is disclosed a process for purifying exhaust gases containing carbon monoxide and hydrocarbons which is highly effective, even when starting cold engines. The system employs a plurality of catalytic zones, preferably the initial catalyst zone being in a separate vessel positioned near the engine manifold, and supplemental fuel is charged to the initial catalyst zone at least during start-up of the engine. After engine start-up, the exhaust gases may be by-passed around the initial catalyst zone and into a subsequent catalyst zone which has been heated during the start-up period by gases passing from the initial catalyst zone. The supplemental fuel addition may be stopped after a predetermined time from the beginning of engine operation. A preferred supplemental fuel is methanol, and preferred catalysts are of the honeycomb type.

3,791,144
REACTOR ASSEMBLY TO REDUCE AUTOMOTIVE EMISSIONS FROM AN INTERNAL COMBUSTION ENGINE

Robert J. Lang, Watchung, N.J., assignor to Esso Research and Development Company, Linden, N.J.

Continuation-in-part of Ser. No. 66,384, Aug. 24, 1970. This application Mar. 31, 1972, Ser. No. 239,940
Int. Cl. F02b 75/10; F01n 3/10
U.S. Cl. 60—278 **23 Claims**

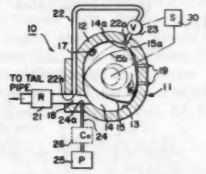


The level of contaminants in exhaust gases emitted from the exhaust ports of an internal combustion engine is markedly reduced by mixing the exhaust gases with air, oxidizing carbon monoxide and hydrocarbons in the mixture in the area adjacent to the exhaust ports during start-up and oxidizing the carbon monoxide and hydrocarbons in a reactor when normal operating temperatures are reached. Flameholders are utilized in each exhaust port of the engine to speed warm-up and lower emissions. A further refinement is the recycle of cooled exhaust gases under certain operating conditions. The reactor is preferentially of the type comprising a generally annular or circular combustion chamber, with exhaust inlet means disposed to tangentially introduce the exhaust gases into the combustion chamber and also containing exhaust outlet means positioned and proportioned relative to the inlet means so that the exhaust gases leaving the reactor through the outlet means are substantially completely combusted. A further refinement is the utilization of nitrogen oxides reducing catalyst means located upstream of the reactor for reducing the level of nitrogen oxides in the exhaust gases prior to combustion thereof in the reactor.

3,791,145
METHOD FOR REDUCING EXHAUST NOXIOUS EMISSION OF ROTARY ENGINE AND THE SYSTEM THEREFOR

Kenichi Yamamoto, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Aki-gun, Hiroshama-ken, Japan

Filed Mar. 8, 1972, Ser. No. 232,671
Claims priority, application Japan, Mar. 10, 1971, 46-13231; May 8, 1971, 46-40445
Int. Cl. F02b 75/10
U.S. Cl. 60—286 **19 Claims**



Method and system for reducing unburned and partially burned noxious gases inevitably contained in engine exhaust gases of a rotary engine having an exhaust gas cleaner in its exhaust system. In the method and system, a fresh air-fuel mixture existing in the engine chamber is periodically introduced into the exhaust system directly into or upstream of the exhaust gas cleaner in response to the compression condition of the engine chamber, thus improving the afterburning condition of the exhaust gas cleaner through warming-up. For this purpose, an enriched mixture left behind in a trailing portion of the engine chamber may exclusively be drawn into the cleaner so as to uniformalize the mixture ratio distribution in the whole engine chamber. Furthermore, the mixture may be shut off when the operating temperature of the cleaner is above a predetermined level dictating that the warming-up thereof is completed.

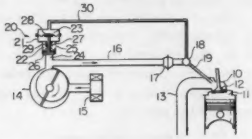
3,791,146
SECONDARY AIR REGULATING SYSTEM FOR AUTOMOTIVE INTERNAL COMBUSTION ENGINE

Yoshimasa Hayashi, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 27, 1972, Ser. No. 247,985
Claims priority, application Japan, Nov. 1, 1971, 46/100897
Int. Cl. F02b 75/10
U.S. Cl. 60—289 **5 Claims**

A secondary air regulating system for regulating the amount of secondary air to be supplied to an exhaust port of an internal combustion engine for facilitating oxidizing reaction of engine exhaust gases to eliminate the noxious and harmful components therein. The secondary air regulating system has an air gallery leading from a pneumatic pump through a main

passageway and communicating with the exhaust manifold of the engine through a secondary air inlet pipe opening into the exhaust manifold, and a control valve assembly which is located in the main passageway to selectively discharge an excess secondary air to the atmosphere to adjust the amount of secondary air to be supplied to the exhaust manifold of the engine to a value optimum for effecting satisfactory oxidizing reaction of the engine exhaust gases, the control valve assembly being adapted to be responsive to at least one of the pressure prevailing in the air gallery and the pressure of exhaust gases in the exhaust manifold thereby to control the amount of leakage of secondary air to the atmosphere in response thereto.

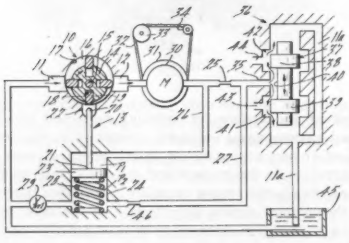


3,791,147

AUTOMOBILE ACCESSORY DRIVE

Christopher Nuss, Warren, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Jan. 15, 1973, Ser. No. 323,555
Int. Cl. F16h *39/46*
U.S. Cl. 60—422 **15 Claims**



A plurality of automobile accessory devices are driven by a single constant speed hydraulic motor by means of the constant fluid output from a variable displacement hydraulic power steering pump driven in turn by the automobile engine at speeds proportional to the engine speed. Constant fluid output from the pump is maintained by a displacement control means that controls the displacement of the pump inversely with the pressure differential across a predetermined restriction in the pump outlet.

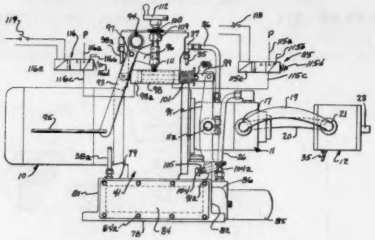
3,791,148

MOTOR-DRIVEN HYDROSTATIC TRANSMISSION

Richard A. Alcock, Rockford, and Wayne A. Shosie, Loves Park, both of Ill., assignors to Fastener Engineers, Inc., Rockford, Ill.

Filed Dec. 13, 1972, Ser. No. 314,757
Int. Cl. F16h *39/46, 41/30*
U.S. Cl. 60—456 **8 Claims**

A motor-driven hydrostatic transmission of the type having an electric drive motor for driving an hydraulic pump that supplies fluid to an hydraulic motor. The electric drive motor and hydraulic pump are face mounted on opposite sides of a centrifugal blower housing with their shafts in alignment and drivingly interconnected by a shaft coupling, and a centrifugal blower is mounted on the shaft coupling for blowing air over a heat exchanger connected in the hydraulic circuit of the hydraulic transmission.

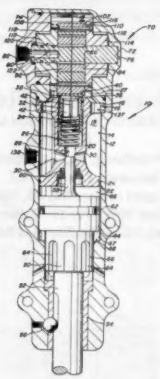


3,791,149

ROTARY ECCENTRIC FLUID MOTOR

Gerald L. Strecker, Arvada, and Dennis L. Schultz, Lakewood, both of Colo., assignors to Gardner-Denver Company, Quincy, Ill.

Filed July 11, 1972, Ser. No. 270,777
Int. Cl. F15b *7/02*
U.S. Cl. 60—543 **4 Claims**



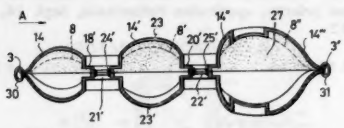
An internal gear type fluid motor comprising an inner gear member mounted stationary and an outer gear or internally toothed member mounted for orbital movement about the stationary inner gear in response to pressure fluid being introduced into the expansible chambers formed by the cooperating gear members. The outer gear member is mounted in a housing which itself is mounted for rotation about an axis in response to the orbital movement of the outer gear member. The housing includes a cam surface which provides an eccentric drive for a hydraulic percussion mechanism. The fluid motor and percussion mechanism are mounted in a tool housing in such a way that the percussion mechanism receives hydraulic fluid discharged from the fluid motor.

3,791,150

FLOATING BREAKWATER FOR ATTENUATING SEAS

Muneoki Tachii, Mito, Japan, assignor to Debero Kogyo Co., Ltd., Mito, Japan

Filed Sept. 7, 1971, Ser. No. 178,083
Int. Cl. E02b 3/06
U.S. Cl. 61—5 1 Claim



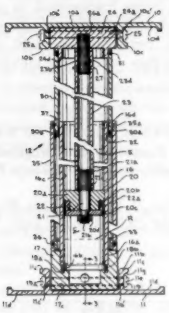
A floating breakwater for attenuating seas which has two or more expanding portions so disposed as for each to be increasingly enlarged in size increasingly, in turn, from the front to the rear and disposed against the propagation of sea waves.

3,791,151

SHORING APPARATUS

David O. Plank, P.O. Box 12591, Houston, Tex.

Filed Nov. 8, 1972, Ser. No. 304,824
Int. Cl. E21d 5/00
U.S. Cl. 61—41 A 3 Claims



A hydraulic shoring apparatus including oppositely positioned trench rails adapted for placement against the sides of a trench or other excavation and hydraulic jack means pivotally connected with the trench rails. The hydraulic jack means including a hydraulic cylinder having a piston slidably mounted therein, the piston having a rod adjustably attached therewith whereby the application of hydraulic fluid under pressure into the cylinder causes movement of the piston and rod to an extended position such that the trench rails are maintained against the sides of the trench. Protective sleeve means are mounted over the cylinder and rod with the rod in the extended position in order to protect both the cylinder and the rod from damage.

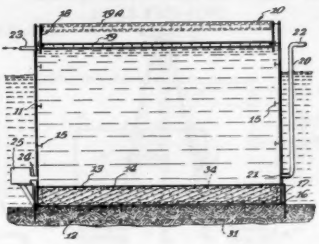
3,791,152

OFFSHORE STORAGE SYSTEM

William Allen Davis, Glen Ellyn, and Gerald Edward Burns, Villa Park, both of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Feb. 16, 1972, Ser. No. 226,775
Int. Cl. E02b 17/00
U.S. Cl. 61—46 10 Claims

An offshore storage tank having a circular cylindrical vertical shell, a continuous horizontal rigid bottom containing solid ballast joined to the shell and adapted to rest on a sea floor, said vertical shell being tall enough to project above sea level, when the bottom is on the sea floor, for a height adequate for the shell to hold, when full, a liquid to a liquid level above sea level to provide a pressure, together with the pressure of the tank weight, adequate to hold the tank in place during storm conditions at a locality where the tank is to be positioned and said vertical shell, only when supplemented by said internal liquid pressure, being able to withstand storm conditions without collapsing when the tank rests on a sea floor.

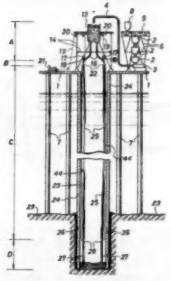


3,791,153

METHOD FOR PLACING HYDRAULIC CONCRETE

Giichi Inoue, Sakai; Naoshi Kubo, Ashiya, and Shogo Hatano, Habikino, all of Japan, assignors to Naoshi Kubo, Ashiya-shi; Osaka Cement Co., Ltd. and Osaka Consulting Engineers, Ltd., both of Osaka-shi, all of, Japan

Filed Feb. 15, 1972, Ser. No. 226,487
Claims priority, application Japan, Feb. 15, 1971, 46-6196; July 13, 1971, 46-51451
Int. Cl. E02d 5/40, 15/02
U.S. Cl. 61—46 6 Claims

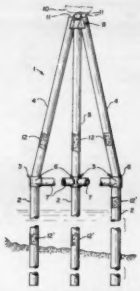


A method for placing hydraulic concrete to form a concrete structure in the water which is characterized in that a paste consisting of portland cement, fine aggregate and water is transferred to the bottom of the water through elastic and watertight tubes, each of said tubes being provided with a paste delivery apparatus having a control valve, and said control valve can be controlled from the remote place above the water surface by means of hydraulic pressure, and after the placement of the predetermined amount of the paste, said tubes are wound up for a certain height and transferring of the paste is repeated again to continue the placing.

3,791,154
MOORING STRUCTURE AND METHOD

Graydon H. Crain, Freedom Rd., R.D. 3, Mars, Pa.

Continuation-in-part of Ser. No. 151,641, June 10, 1971. This application Mar. 2, 1973, Ser. No. 337,595
Int. Cl. E02d *13/00*; E02b *3/06*; E04h *12/06*
U.S. Cl. 61—46 3 Claims

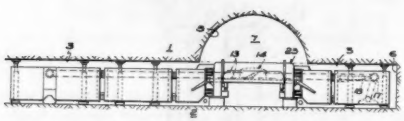


This invention relates to a mooring structure and method, comprising a triangular template or diaphragm having vertical sleeves at the corners through which tubular legs or piles are driven in telescoping arrangement. The vertical sleeves have diametrical offsets to enable their easy connection to the diaphragm. The sleeves are welded to angularly cut bottom ends of the legs. A prefabricated triangular casting is welded to the interior surfaces of the tops of the legs. Concrete is then poured through a funnel simultaneously into all the legs. One or more diaphragms may be used with each structure at a selected height above or below the water level.

3,791,155
STOWING AND PACKING DEBRIS IN MINES

Peter Lockwood, Sheffield, England, assignor to Lockwood Bennett Limited, Sheffield, England

Filed June 26, 1972, Ser. No. 266,477
Int. Cl. E21f *15/00*
U.S. Cl. 61—63 23 Claims

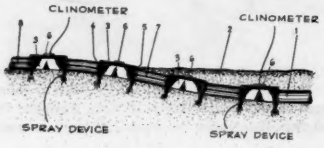


Underground stowing or packing apparatus for stowing or packing debris into a pack-hole or worked out mineral seam comprising, when the apparatus is operationally associated with the pack-hole or seam, one or more chains adapted to extend over the length of the pack-hole or seam required to be stowed or packed with debris and into or beyond a mine roadway adjacent to said pack-hole or seam, the chain or chains each having an upper and lower run passing at their ends about a drive sprocket and a return sprocket respectively and only being guided and supported at their ends, a sweeping means mounted on the chain or chains so as to be located at or near the roof of the pack-hole or worked out seam and so as to be traversable by the chain or chains between a debris collecting position and a debris packing or stowing position, means to anchor the drive and return sprockets so as to tension the chain or chains therebetween and means for constraining the movement of debris away from a pack as it is being formed in the pack-hole or worked out mineral seam.

3,791,156
METHOD AND APPARATUS FOR DETERMINING THE POSITION OF A PIPELINE OR THE LIKE DURING THE ENTRENCHING THEREOF

Antonie C. Van Zutphen, Bergschenhoek, Netherlands, assignor to N.V. Industrieele Handelscombinatie Holland, Rotterdam, Netherlands

Filed Sept. 13, 1971, Ser. No. 179,793
Claims priority, application Netherlands, Sept. 14, 1970, 7013562
Int. Cl. E02f *5/02*; B21c *51/00*
U.S. Cl. 61—72.4 4 Claims

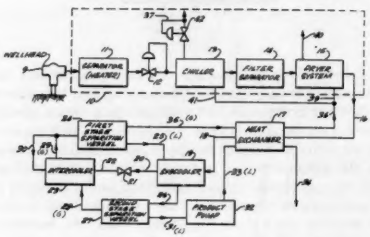


Pipelines are entrenched on a marine floor by dragging therealong a plurality of spray nozzles that dig a trench for the pipeline. Undesirably sharp local curvature of the pipeline is avoided by providing each spray device with a clinometer the clinometer readings being transmitted to a point above the surface of the water and the composite of these received clinometer readings permitting control of the trenching process so as to avoid that undesirable curvature.

3,791,157
PROCESS FOR PURIFICATION OF NATURAL GAS

Richard R. Tracy, Pasadena, and Reginald G. Spear, San Marino, both of Calif., assignors to Tioga Wells Corporation, Pasadena, Calif.

Filed Nov. 9, 1970, Ser. No. 87,853
Int. Cl. F25j *1/00*, *3/06*
U.S. Cl. 62—41 13 Claims



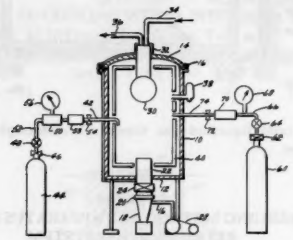
Process for the purification of natural hydrocarbon gases which, as may be produced at a wellhead, are contaminated by substantial proportions of incombustible constituents such as nitrogen. Contaminated gas at elevated pressure is condensed by cooling in two steps, thereafter expanded to approximately atmospheric pressure to effect phase separation between a hydrocarbon-rich liquid and a contaminant-rich vapor. The hydrocarbon-rich liquid is partially vaporized and a second phase separation yields a liquid enriched in hydrocarbon. The vapor from the second separation is cooled and returned to the first separation while the vapor product from first separation along with the liquid product from the second separation are separately employed to effect condensation of the contaminated hydrocarbon.

3,791,158

CRYOSORPTION PUMPING WITH FROST SORBENTS

Kenneth E. Tempelmeyer, Toronto, Ontario, Canada, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 23, 1972, Ser. No. 283,023
Int. Cl. B01d 5/00
U.S. Cl. 62—55.5 3 Claims



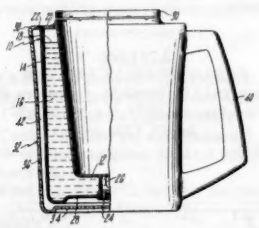
A system for providing very high vacuums in closed vessels having a hydrogen, helium or neon gaseous atmosphere. The gaseous atmosphere is placed in communication with a cryogenically cooled frost coated structure. The frost is formed on the cooled surface by depositing a sorbent gas, such as carbon dioxide, sulfurdioxide or methyl chloride onto the surface under processing conditions that produce a disordered or amorphous frost structure. The formation technique utilized in forming the frost provides a structure that adsorbs hydrogen, helium or neon gas molecules as they come in contact with the frost surface to a degree not heretofore achieved. As a result, the hydrogen, helium or neon atmosphere is, in effect, pumped out of the closed vessel resulting in the production of a very high vacuum therein.

3,791,159

METHOD FOR CONVERTING A LIQUID COMESTIBLE TO A PARTIALLY FROZEN CONDITION

Edward J. Devlin, Madison, Conn., assignor to Glacier Ware, Inc., Clinton, Conn.

Continuation-in-part of Ser. No. 53,231, July 8, 1970. This application July 21, 1971, Ser. No. 164,790
Int. Cl. A23g 5/00
U.S. Cl. 62—68 7 Claims



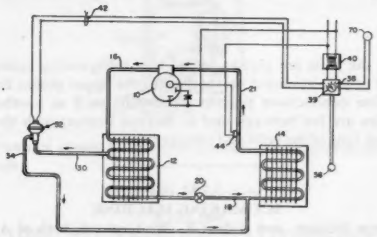
A method for converting an individual serving portion of a liquid comestible such as a carbonated beverage or the like to a partially frozen, two phase composite mixture of macroscopically uniform thixotropic consistency. In the method, an enclosed conversion zone for containing the comestible and a refrigerant zone containing a refrigerant in a particular mass ratio to the comestible mass are provided. The refrigerant zone partially surrounds and is in heat transfer relationship with the conversion zone. The refrigerant is frozen and the liquid comestible is subsequently placed in the conversion zone and converted to a slush-like condition by transfer of heat energy from the conversion zone to the refrigerant zone.

3,791,160

AIR CONDITIONING SYSTEM WITH TEMPERATURE RESPONSIVE CONTROLS

Rubin Seymour Savitz, Hillside, and Paul Komroff, Union, both of N.J., assignors to National Union Electric Corporation, Jersey City, N.J.

Filed Sept. 16, 1971, Ser. No. 180,991
Int. Cl. F25b 41/00
U.S. Cl. 62—196 1 Claim



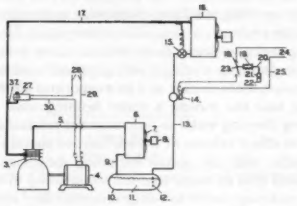
An air conditioning system comprising a compressor, condenser, and evaporator includes a refrigerant bypass line for passing a portion of the heat laden high-pressure refrigerant from the compressor output into the lower heat level reduced pressure refrigerant fed to the evaporator or the suction line of the compressor. A valve in the bypass line monitors the flow of the bypassed refrigerant as a function of room temperature to thereby continuously modulate the thermal capacity of the system in order to maintain room temperature relatively constant.

3,791,161

PRESSURE SWITCH FOR REFRIGERATION SYSTEM

Daniel E. Kramer, 2009 Woodland Dr., Yardley, Pa.

Filed Apr. 10, 1972, Ser. No. 242,442
Int. Cl. F25b 1/00
U.S. Cl. 62—226 6 Claims



A pressure switch for sensing and responding to pressure on the low side of refrigeration systems where the conduit, which connects the refrigeration system low side to the pressure switch bellows, is restricted for the purpose of minimizing transmission of pressure pulsations from the low side to the bellows. The conduit has a substantial enlargement positioned to act to prevent the entry of oil into the restricted portion of the conduit.

3,791,162

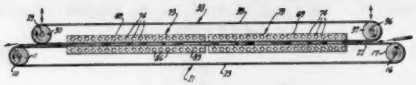
DOUBLE BELT FREEZING MACHINE

Edward D. Baker, Belmont, Calif., assignor to NPI Corporation, Burlingame, Calif.

Filed July 13, 1972, Ser. No. 271,247
Int. Cl. F25c 5/14
U.S. Cl. 62—341 4 Claims

A double belt freezing machine has a pair of thermally conducting belts trained around drums mounted on a frame so

that the horizontal upper run of the lower belt and the horizontal lower run of the upper belt are spaced apart a distance adjustable by moving a carriage on which the upper belt is mounted up and down on the frame. In thermal contact

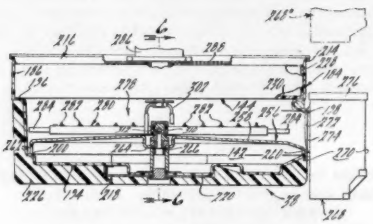


with the belts are platens joined to a refrigerating system at least in part mounted on the frame, the upper platen having flexible connections thereto. Foodstuffs such as hamburger patties are fed between and in thermal contact with the adjacent runs of the belts and emerge frozen.

3,791,163
ICE MAKING MACHINE

George Dickson, and Robert K. Westergaard, both of Alden, Minn., assignors to King-Seeley Thermos Co., Ann Arbor, Mich.

Filed Oct. 18, 1971, Ser. No. 190,234
Int. Cl. F25c *1/12*
U.S. Cl. 62—347 **42 Claims**



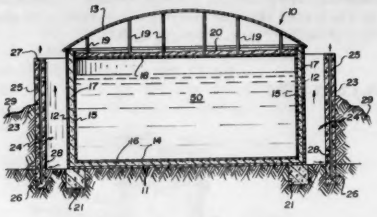
An ice-making machine comprising a plurality of ice-forming molds or cups; a rotatable water spray bar for communicating make-up water from a water sump toward the molds during a freezing cycle; a refrigeration system including a compressor, a condensor and an evaporator for freezing water sprayed into the molds; a water holding tank or platen for retaining thawing water in heat transfer relationship to the ice molds to effect release of the ice formed therein during a harvest cycle, with the platen including means providing for a controlled flow of water into the water sump to cause dilution of the make-up water and thus minimize any accumulation of foreign material within the water system; the refrigerator evaporator, ice-forming molds, water spray bar, as well as the water sump and platen being arranged in a compact unitized assembly; and a control system for operating thh spray bar and associated water pump continuously during both the harvest and freezing cycles, whereby to assist in effecting release of the ice formed in the ice-forming molds and thus reduce the overall cycle time of the machine.

3,791,164
CRYOGENIC STORAGE TANK FACILITY WITH DIKE WALL COOLED BY LEAKING LIQUEFIED GAS

Royce Jay Laverman, South Holland, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed May 15, 1972, Ser. No. 253,111
Int. Cl. F17c *7/03*
U.S. Cl. 62—50 **9 Claims**

A storage tank facility for a liquefied gas having an enclosed tank, a vertical dike wall around and spaced from the tank side wall thereby defining a well space between the dike wall and the tank side wall and a plurality of vertical conduits in the dike wall communicating with the bottom of the well space for

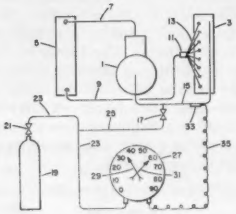


venting cold liquefied gas vapors therethrough to the atmosphere.

3,791,165
CHARGING METHOD AND APPARATUS FOR A REFRIGERATION SYSTEM

Fred V. Honnold, Jr., North Syracuse, and Richard L. Johnson, Baldwinsville, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 18, 1971, Ser. No. 199,948
Int. Cl. F25b *45/00*
U.S. Cl. 62—77 **7 Claims**

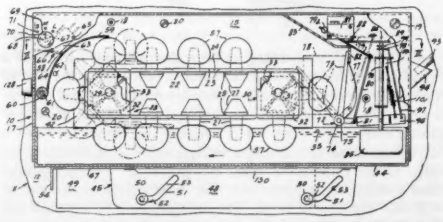


A method and apparatus for accurately charging a refrigeration system having a fixed restriction refrigerant expansion device by adding or removing refrigerant to the system to obtain a preselected superheat temperature of the refrigerant leaving the evaporator coil as sensed by the difference in pressure of the refrigerant leaving the evaporator coil and the pressure of refrigerant in a refrigerant charged sensing bulb disposed in heat transfer relation with the refrigerant line leaving the evaporator.

3,791,166
CLEAR ICE PELLET MAKER

Leroy R. Maleck, 1012 W. Frank St., Galesburg, Ill.

Filed June 26, 1972, Ser. No. 266,277
Int. Cl. F25c *1/10*
U.S. Cl. 62—138 **27 Claims**



Ice pellets are formed on orbitally moving freezing studs guided to dip repeatedly into a water supply until the desired

pellet size has built up and is sensed by a size selector which activates an ice harvester ejector to displace the pellets from the studs. Water supply control, easily cleanable water tray and segmented plastic belt or drum type stud carriers are provided. Mounting of the device may be effected in the freezing or refrigerating compartment of a domestic refrigerator, utilizing freezing air from the freezing compartment.

3,791,167

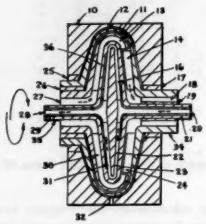
HEATING AND COOLING WHEEL WITH DUAL ROTOR

Michael Eskeli, 6220 Orchid La., Dallas, Tex.

Filed Jan. 20, 1972, Ser. No. 219,212

Int. Cl. F25b *3/00*

U.S. Cl. 62—401 **11 Claims**



A method and apparatus for producing heating or cooling by passing two fluids in heat exchange relationship with each other within two rotating rotors wherein said fluids are pressurized to a higher pressure. The first fluid is a compressible fluid, such as air, which when compressed will also have a temperature increase; the second fluid may be either a compressible fluid or may be a liquid, which when compressed may not have a temperature increase or the temperature increase for the second fluid is less than the said temperature increase for said first fluid. Heat then will be transferred from said first fluid to said second fluid, so that when said fluids are discharged from said rotors, said first fluid will be at lower temperature at exit than at entry, and said second fluid will leave said rotor at a higher temperature than the temperature that said second fluid enters. For the first fluid, air or other compressible gases may be used; said air may enter at ambient temperature. For said second fluid, air, water or other fluids may be used; said water or air may be at ambient or natural temperature at entry. Said apparatus may be used as a heating and cooling unit for air conditioning, or be used as a liquid heater, or be used as a vaporizer or steam generator.

3,791,168

APPARATUS FOR OPENING AND CLOSING A DOOR IN THE DUCT WORK OF AN AIR CONDITIONED TRANSPORTATION VEHICLE

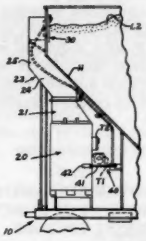
Edward L. Coyle, St. Charles, and Howard L. Murph, St. Louis, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Aug. 30, 1972, Ser. No. 285,105

Int. Cl. F25d *17/04*

U.S. Cl. 62—408 **11 Claims**

In an air conditioned transportation vehicle such as a railroad car, a door is provided in the duct work carrying return air to the air conditioning unit. Actuating means to open and close the door are provided adjacent the air conditioning unit which cover a point of reference on or near the air conditioning unit such as a thermometer and/or thermostat when the door is closed and exposes the reference point when the door is open. Thus it will be easy for an operator to determine that the door is properly closed when the air conditioning unit is not being used and insure that lading will not follow the duct work into the air conditioning unit when the unit is off and the lading is usually smaller and more readily blown, and is filled to a greater height in the vehicle, near the duct work. Locking means may be provided to insure that the door will remain in



the open or closed position, as desired, during transit and/or storage.

3,791,169

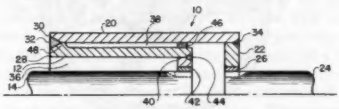
TORSIONALLY RESILIENT SHAFT COUPLING

John Wright, Baltimore, Md., assignor to Koppers Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 123,666, March 12, 1971, Pat. No. 3,673,813. This application June 30, 1972, Ser. No. 268,049

Int. Cl. F16d *3/00*

U.S. Cl. 64—1 V **12 Claims**



A coupling for connecting a pair of coaxially aligned shafts for torsionally resilient driving rotation, comprising a first tubular member surrounding a portion of at least one of the shafts and having an end adapted for connection to the shaft; second tubular member surrounding the first tubular member and having an end adapted for connection to the other shaft; and the remaining ends of both tubular members being joined to one another for forming a torsionally resilient connection between the shafts.

3,791,170

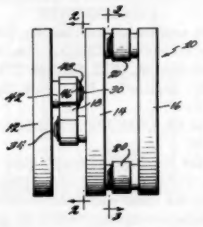
COUPLING

Richard Schmidt, Cincinnati, Ohio, assignor to The Tool Steep Gear & Pinion Company, Cincinnati, Ohio

Filed Nov. 7, 1972, Ser. No. 304,413

Int. Cl. F16d *3/70*

U.S. Cl. 64—19 **12 Claims**



A coupling comprising three disk-like members arranged to provide a central member and outer members on opposite

sides thereof and two pairs of parallel links pivotally interconnected between adjacent members, the members being of a shape which is symmetrical about an axis of rotation and the links being arranged symmetrically about the axis of rotation when the coupling is connected between two shafts in axial alignment, the coupling being operable to drivingly interconnect the shafts when in such alignment without vibration or when disposed or moved into various misaligned positions with a minimum of vibration and with constant angular output movement in response to constant angular input movement during each revolution.

3,791,171

CENTRIFUGAL GOVERNOR PARTICULARLY FOR ALTERING THE MOMENT OF INJECTION START IN DIESEL ENGINES

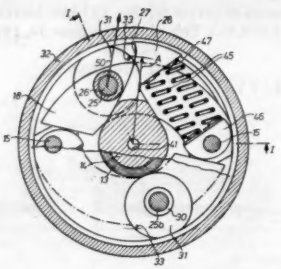
Eberhard Hofmann, Kirchberg/M. Neuhof, Germany, assignor to Robert Boach GmbH, Stuttgart, Germany

Filed July 5, 1972, Ser. No. 269,174

Claims priority, application Germany, July 14, 1971, P 21 35 111.1

Int. Cl. F16d *5/00*

U.S. Cl. 64—25 **3 Claims**



In a centrifugal governor connecting a driving shaft with an axially aligned driven shaft for varying the phase angle between the two shafts in an rpm-dependent manner, each centrifugal weight rotates in unison with the driving shaft and has a rigidly affixed pin extending parallel to and spaced from the pivotal axis of the weight. The pin projects beyond either side of the weight. One terminus of the pin is in continuous engagement with a curved track of a component keyed to the driven shaft for changing the phase angle as the weights swing in response to an rpm change. The other terminus of the pin carries an abutment ring of arbitrary diameter which, after the weight has swung through a predetermined path, engages the bounding edge of a recess provided in a component affixed to the driving shaft to limit the phase angle alteration to a predetermined, arbitrary value.

3,791,172

APPARATUS FOR MAKING A GLASS OR THE LIKE COATED WIRE

Giovanni Manfre, and Domenico Vianello, both of Novara, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

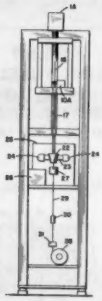
Filed July 20, 1972, Ser. No. 273,638

Claims priority, application Italy, July 21, 1971, 7513/71; July 21, 1971, 7514/71

Int. Cl. C03b *37/02*; **B22d** *11/00*

U.S. Cl. 65—11 W **4 Claims**

An apparatus for coating a wire with glass or the like having a means for moving a metal rod and a glass or the like tube thereabout along the same path independently of each other into a heating means comprises rollers for gripping and moving the rod and a worm screw and carriage threadedly secured to the screw and for gripping the tube. The rollers and carriage are driven by independent drive means. A device for heating the metal rod is provided with a truncated conically shaped crucible heated electrically as a resistor and with means for



cooling a coated wire drawn from the mass of metal and glass in the crucible.

3,791,173

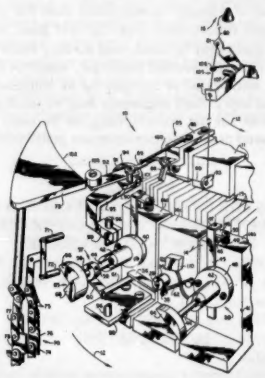
METHOD AND APPARATUS FOR FORMING RANDOM STRIPE IN KNITTED GARMENTS

Tommy R. Furr, Oakboro, N.C., assignor to Oxford Industries, Inc., Atlantic, Ga.

Filed Mar. 23, 1972, Ser. No. 237,277

Int. Cl. D04b *9/06, 15/32, 15/60*

U.S. Cl. 66—20 **6 Claims**



A dial and cylinder circular knitting machine wherein yarns are continuously fed to the needles at most of the pairs of needle cam sections revolving about the needles while at selected ones of the other pairs of cylinder cam sections the knitting movements of the short cylinder needles are arrested and no yarn is fed to the needles at these pairs of cam sections. When a colored stripe is to be knitted in the fabric the selected pairs of the cylinder cam sections are adjusted to cause the short cylinder needles to knit and yarn of a different color is fed to the needles at the adjustable cylinder cam sections.

3,791,174

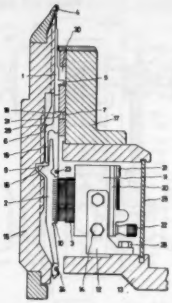
PATTERNING MECHANISM FOR CIRCULAR KNITTING MACHINES

Jose Maria Dalmau Guell, Badalona, Spain, assignor to Jumberca, S. A., Badalona, Spain

Division of Ser. No. 868,046, Oct. 21, 1969, abandoned. This application Nov. 1, 1971, Ser. No. 194,622

Int. Cl. D04b *9/38, 15/68*

U.S. Cl. 66—50 R 2 Claims



A rocking jack pattern mechanism for a circular knitting machine in which corresponding pairs of selector jacks and intermediate jacks cooperate in controlling selection of needles to perform knitting operations and in which cancellation of selection of corresponding pairs of selector and intermediate jacks occurs during the performance of knitting operations by the corresponding needles and selection of corresponding pairs of selector and intermediate jacks occurs prior to initiation of the next subsequent knitting operation to be performed by the corresponding needles.

3,791,175

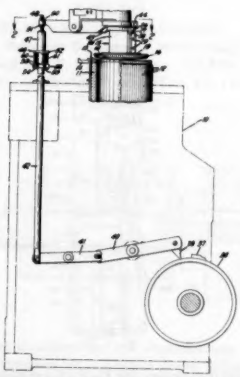
SAFETY DEVICE FOR DIAL TRANSFER CAMS

Walter Imboden, Wyomissing, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed May 18, 1972, Ser. No. 254,443

Int. Cl. D04b *15/02*

U.S. Cl. 66—95 2 Claims



A dial transfer cam safety device for a circular hosiery knitting machine that includes a toe closing apparatus. The device is provided with a mechanism for suppressing the selected movement of the transfer cam into operating engagement with the butts of transfer bits should said butts be out of alignment for receiving the cam when entering that cycle of closing the toe of the knitted hosiery article being formed.

3,791,176

DETECTION DEVICE FOR ERRORS IN THE ANGULAR POSITION OF A PATTERN CONTROL DRUM FOR A TEXTILE MACHINE

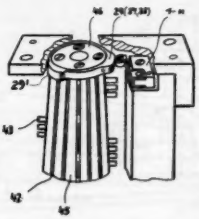
Pius Kohler, Wurmlingen, and Falk Kuhn, Kiebingen, both of Germany, assignors to Fouquet-Werk Frauz & Planck, Rottenburg am Neckar, Germany

Filed Dec. 15, 1971, Ser. No. 208,115

Claims priority, application Germany, Dec. 28, 1970, 2064013

Int. Cl. D04b *15/66*

U.S. Cl. 66—138 17 Claims



The Jacquard pattern controllers are formed as holders for pattern jacks, and mounted for indexing movement with movement of the textile machine, typically a flatbed or circular knitting machine; to monitor the position of the pattern holders, electrical switches are fixed in location with respect to the holders, which are provided with switch operating cams, or the like, the electrical contacts being connected in a supervisory circuit which determines the state of the switches and, when one of the switches is not in its predetermined state, gives an alarm signal and stops the machine. The supervisory circuit may be a pair of circuits, through which the switches are all connected in parallel, the circuit sensing whether the switches are all open, or all closed, and at least one switch not being in its proper position, causing the alarm.

3,791,177

CIRCULAR KNITTING MACHINES

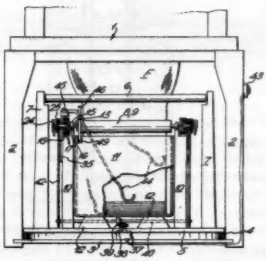
Barry Frederick Swanwick, Melton Mowbray; Colin Vincent Roper, Braunstone, and Dennis Gell, Leicester, all of England, assignors to Stibbe Machinery Limited, Leicester, England

Filed Jan. 12, 1972, Ser. No. 217,332

Claims priority, application Bulgaria, Jan. 21, 1971, 2,850/71

Int. Cl. D04b *35/00*

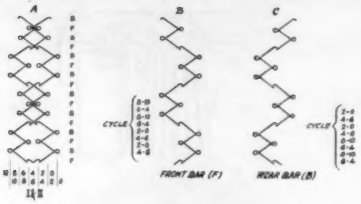
U.S. Cl. 66—147 22 Claims



Method and apparatus for stacking knitted fabric issuing from a circular knitting machine in layers in a container by im-

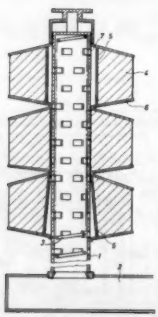
parting reciprocal motion to the fabric so that it is folded in concertina fashion. The means for layering the fabric are in the form of a pair of rods or rollers driven by reversible or non-reversible drive means, said rods or rollers operating in a stationary horizontal plane, or being raised in increments with the stacked fabric.

3,791,178
KNIT FABRIC
Robert B. Meyer, 25 Luddington Rd., West Orange, N.J.
Filed June 28, 1971, Ser. No. 157,240
Int. Cl. D04b *21/00*
U.S. Cl. 66—196 **1 Claim**



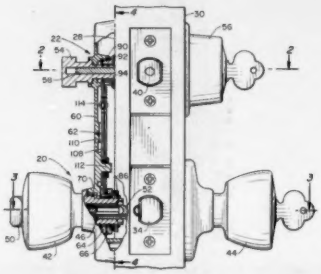
A multi-layer fabric formed of monofilament threads, each layer having a pattern forming relatively large interstices between the interlocked threads and wherein the two layers are interlocked so that the interstices of one layer are displaced relative to those of the other layer.

3,791,179
APPARATUS FOR DYEING YARNS IN BOBBINS
Jens Brun, Hornbaek, Denmark, and Hans Nielsen, Reinach, Basel-Land, Switzerland, assignors to Vald. Henriksen A/S, Soborg, Denmark
Filed Feb. 24, 1972, Ser. No. 228,844
Claims priority, application Denmark, Feb. 24, 1971, 838/71
Int. Cl. B05c *8/02, 11/122*
U.S. Cl. 68—198 **2 Claims**



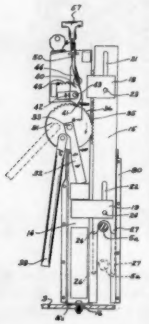
An apparatus for dyeing bobbins in which there is a coil spring in the distributor pipe on which the bobbins are placed.

3,791,180
COMBINED LATCH BOLT AND DEAD BOLT MECHANISM INCLUDING SINGLE ACTION DOUBLE BOLT RELEASE
William J. Doyle, La Habra, Calif., assignor to Emhart Corporation, Bloomfield, Conn.
Filed Apr. 24, 1972, Ser. No. 246,648
Int. Cl. E05b *63/14*
U.S. Cl. 70—107 **16 Claims**



First and second latch assemblies are interconnected such that operation of inside and outside operators of the second latch assembly will extend or retract a deadbolt of the second latch assembly without affecting the first latch assembly, operation of an outside operator of the first latch assembly will retract a spring extended latch of the first latch assembly without affecting the second latch assembly, and operation of an inside operator of the first latch assembly will retract both the latch of the first latch assembly and the deadbolt of the second latch assembly generally simultaneously. The interconnection between the latch assemblies preferably includes a rotatable gear and pivotal rack.

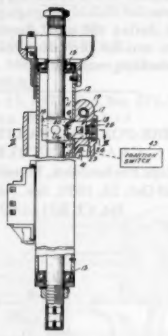
3,791,181
BRAKE LOCKING DEVICE FOR PREVENTING THEFT OF SELF-PROPELLED VEHICLES
Manuel Fouces, and Juan M. Fouces, both of 2416 Mandell, Houston, Tex.
Filed Feb. 8, 1972, Ser. No. 224,483
Int. Cl. G05g *5/00*
U.S. Cl. 70—202 **3 Claims**



A device for preventing the theft of a self-propelled vehicle, such as an automobile, may comprise a support carriage attached to the floorboard of the vehicle near its brake pedal and fastening apparatus carried by the support carriage, movable from a first position to a second position engaging the brake pedal and holding it in a depressed position. An operat-

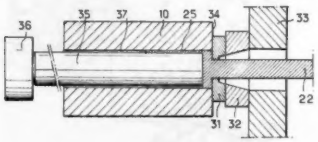
ing assembly may be provided for moving the fastening apparatus to the second position. A lock may also be provided for engagement with the operating assembly to lock the fastening apparatus in the second position.

3,791,182
STEERING COLUMN LOCKING DEVICE
Gerald K. Oxley, and Mahendrakumar B. Shah, both of Lafayette, Ind., assignors to TRW Inc., Cleveland, Ohio
Filed May 18, 1972, Ser. No. 254,382
Int. Cl. B60r *25/02, 25/04*
U.S. Cl. 70—252 **1 Claim**



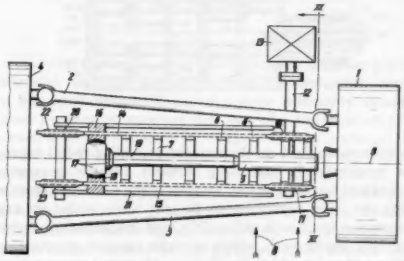
Ignition and steering column lock for motor vehicles operated by a key controlling both the ignition switch and steering column locking element. The lock comprises a bolt biased by a spring to engage a keeper hole in a sleeve secured to the steering column. The bolt is withdrawn by a cam operated by turning movement of the key and key cylinder. The ignition switch is operated by a rod rectilinearly moved by turning movement of the key cylinder through a rack and pinion connection. A blocking plunger is guided in the lock housing to block movement of the rod and key cylinder when moving in a direction to lock the steering column. The plunger is depressible by the operator to free movement of the rod to accommodate movement of the key cylinder to effect locking of the steering column.

3,791,183
HEAT-EXTRUSION METHOD
Robert Creuzet, Route de Beyssac, 47 Marmande, France
Filed Feb. 9, 1971, Ser. No. 113,820
Claims priority, application France, Feb. 19, 1970, 7005988
Int. Cl. B21b *45/00*
U.S. Cl. 72—46 **1 Claim**



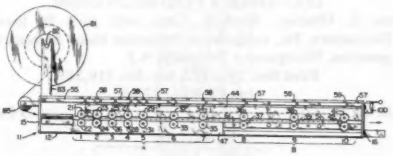
A method and machine for the manufacture of metallic parts by heat extrusion of a heated metal billet through a draw-plate. Prior to being pressed, by means of a chisel the front surface of which is smaller than that of the billet, the latter is coated on its lateral surface, as well as on its front face, with a powdered retaining product, so that after extrusion there remains on the inner wall of the bore of the container housing the billet a skirt of metal whereby is produced a metallic part the outer surface of which is devoid of any defects.

3,791,184
SKEW ROLLING OF SOLID INGOTS
Gerd Pfeiffer; Hans-Peter Kran, both of Mulheim/Ruhr, and Wilhelm Feldmann, Duisburg, all of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany
Filed Aug. 26, 1971, Ser. No. 175,361
Claims priority, application Germany, Sept. 3, 1970, 7033450[U]
Int. Cl. B21b *19/04*
U.S. Cl. 72—97 **2 Claims**



Skew rolling mill for piercing solid ingots having a stand with a center line and a mandrel on that line on one side of the stand, and pushing means on the other side of the stand, mounted for turning on an axis and for pivoting transverse thereto, the pushing means mounted on a cross bar; first and second drum means driven in unison and disposed respectively on both sides of the center line, on said other, the feeder side of the stand, the drum means having pitch circle that is tangent to a plane that runs through the center line; chains on the drum means and connected to the cross bar for displacing the cross bar and the pushing means on the center line.

3,791,185
METHOD AND APPARATUS FOR FORMING MULTIPLE PANEL SHAPES
Gary A. Knudson, 7485 Upham Ct., Arvada, Colo.
Filed Aug. 3, 1972, Ser. No. 277,519
Int. Cl. B21d *5/08*
U.S. Cl. 72—181 **11 Claims**



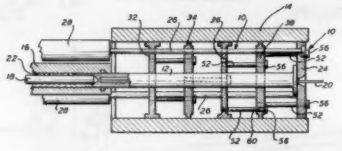
A method and apparatus for forming more than one shape in a material wherein a first group of pairs of opposed rollers are arranged to impart a first shape to the material and a second group of pairs of opposed rollers following the first group are arranged to impart a second shape to the first-shaped material. One roller or each pair of the second group being readily releasable and conjointly movable away from the other associated roller of each pair to a non-shaping position to alternately form only the first shape or the first and second shapes in the material. A roller bending arrangement at the inlet end bends the material with a coil set against the coil set to a substantially flattened condition prior to contact with the

first and second groups of rollers to reduce the tendency thereof to buckle or ripple during the shaping thereof.

3,791,186
COLLAPSIBLE FEED MECHANISM

George A. La Lena, Warminster, and Jack D. Stewart, Doylestown, both of Pa., assignors to Princeton Metal Systems Corporation, Montgomery Township, N.J.

Filed Dec. 29, 1972, Ser. No. 319,284
Int. Cl. B21c *27/00*
U.S. Cl. 72—272 **8 Claims**

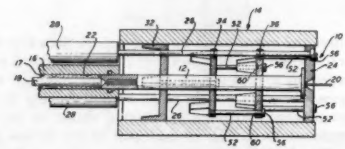


A collapsible feed mechanism for providing radial support to a longitudinally extending member and for preventing bending and buckling of said longitudinally extending member during the axial advancement thereof while under an axial compressive load, such collapsible feed mechanism for residing axially displaceably within an outer support structure, including a plurality of axially displaceable radial support members positioned around the longitudinally extending member; each radial support member having an outer axial surface and an inner axial surface; the outer axial surfaces of alternate ones of the radial support members being greater in axial length than the inner axial surfaces of the alternate ones of the radial support members; the inner axial surfaces of other alternate ones of the radial support members being greater in axial length than the outer axial surfaces of the other alternate ones of the radial support members; the outer axial surfaces of greater axial length for slidably engaging the outer support structure during the axial displacement of the radial support members and for preventing the tendency of the axially displaceable support members to rotate with respect to an axis perpendicular to the longitudinally extending member and bind during the axial displacement of the radial support members; the inner axial surfaces for slidably engaging the longitudinally extending member during the axial displacement of the radial support members and for providing the radial support to the longitudinally extending member.

3,791,187
COLLAPSIBLE FEED MECHANISM

Gene L. Oberley, Minford, Ohio, and Jack D. Stewart, Doylestown, Pa., assignors to Princeton Metal Systems Corporation, Montgomery Township, N.J.

Filed Dec. 29, 1972, Ser. No. 319,287
Int. Cl. B21c *27/00*
U.S. Cl. 72—272 **3 Claims**

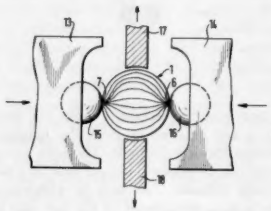


Collapsible feed mechanism for providing radial support to a longitudinally extending member and for preventing bending and buckling of the longitudinally extending member during the axial advancement thereof while under an axial compressive load, such collapsible feed mechanism typically residing axially displaceably within an outer support structure, including a plurality of axially displaceable radial support members positioned around the longitudinally extending member and for providing the radial support thereto; each radial support member having an outer axial surface and an inner axial surface and the outer axial surface being greater in axial length than the inner axial surface; the outer axial surfaces of greater axial length for slidably engaging the outer support structure during the axial displacement of the radial support members and for preventing the tendency of the axially displaceable support members to rotate with respect to an axis perpendicular to the longitudinally extending member and bind during the axial displacement of the radial support members; and the inner axial surfaces for slidably engaging the longitudinally extending member during the axial displacement of the radial support members and for providing the radial support to the longitudinally extending member.

3,791,188
METHOD OF DIE-FORMING PARTS WITH IMPROVED GRAIN STRUCTURE

Emil Deussen, Haus Hoehenblick, Munderkingen, Germany

Filed Oct. 26, 1971, Ser. No. 192,289
Int. Cl. B21j *5/02*
U.S. Cl. 72—356 **5 Claims**

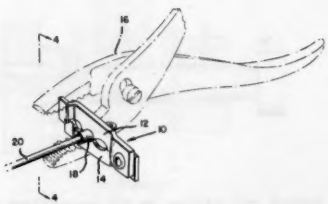


A method of die-forming parts so that, in their final shape, they have a substantially continuous grain structure, whereby a cylindrical blank is shaped into a spherical part by drawing the grain line ends together in two polar areas, and the spherical part is reshaped into a ring of final dimensions without breaking any of the grain lines.

3,791,189
CRIMPING TOOL

Gustaf Rudolph Lawson, Willingboro, N.J., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 14, 1972, Ser. No. 306,464
Int. Cl. B21d *37/00*
U.S. Cl. 72—410 **8 Claims**



A crimping tool has identical stamped and formed second class levers which are pivotally joined at their first ends so that a pair of pliers or the like may be used to apply compression force at the opposite free ends to cause the levers to pivot toward each other. The levers respectively have aligned, inter-

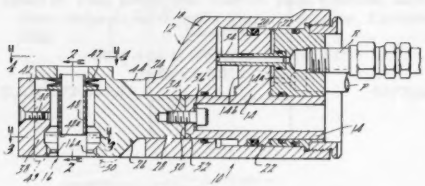
mediate portions which include at least one pair of dies in their opposed faces for crimping a terminal to a wire when compression force is applied at the free ends. The first ends are in over-lapping side-by-side relationship with respective coaxially aligned holes extending therethrough to receive a pin about which the levers pivot. The free ends are respectively misaligned and include overlapping alignment tabs so that when the tool is oriented with respect to the pliers in any position which will cause the levers to pivot toward each other, the compression forces are resolved in a direction to produce sliding contact between the tabs and the free ends to maintain the intermediate portions of the tool in alignment throughout crimping.

3,791,190

TWO JAW TOOL

Peter R. Chirco, Utica, Mich., assignor to Huck Manufacturing Company, Detroit, Mich.

Filed July 13, 1972, Ser. No. 271,568
Int. Cl. B21d *37/10*
U.S. Cl. 72—412 **1 Claim**



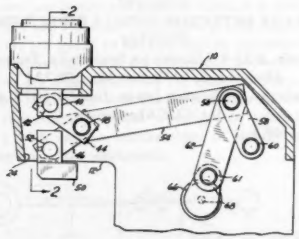
A two jaw crimping tool for crimping a nut onto a bolt and in which the nut and bolt extend through the jaws in a direction transverse to the direction of motion of the piston actuating the jaws.

3,791,191

PRESS PRESSURE AND CLOSED POSITION CONTROL

Joseph W. Baldyga, Mt. Clemens, Mich., assignor to Diamond Die & Mold Co., Mt. Clemens, Mich.

Filed Nov. 29, 1971, Ser. No. 202,896
Int. Cl. B21j *9/18*
U.S. Cl. 72—431 **9 Claims**



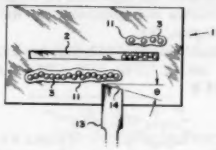
A mechanically actuated press in which actuating means has a predetermined stroke normally effective to move a die or the like into a predetermined position relative to a work support or second die. The actuating means is extensible, such for example as a toggle, and acts between the movable die and a prestressed resilient abutment to limit the application of pressure.

3,791,192

PARTICLE STANDARD AND CALIBRATION METHOD

John V. Butler, Newhall, Calif., assignor to Lockhead Aircraft Corporation, Burbank, Calif.

Filed July 3, 1972, Ser. No. 268,852
Int. Cl. G01n *15/00*
U.S. Cl. 73—1 R **58 Claims**



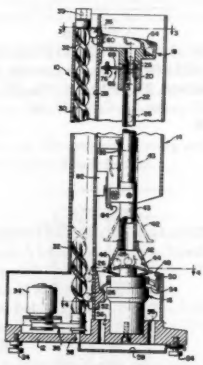
Apparatus and method for establishing an absolute particle calibration standard useful for fluid contamination control and like applications. A soluble carrier releasably secures a known number of standard size particles (microbeads) in a geometric array, which serves as the reference standard. The carrier may be selectively dissolved to release the standard particles into the system to be tested or calibrated. The reference standard is manufactured by introducing solid particles of known size, or within a given size range, into a precisely-dimensioned metering slot or groove which constrains a predetermined number of the particles in the desired array. Examination by microscope or other suitable means verifies the count of the standard particles. The geometry of the array facilitates visual counting. A soluble adherent carrier medium is applied to the arrayed particles, after which the carrier and the adhered particles may be removed from the metering slot and transported as an integral set.

3,791,193

LENS FRANGIBILITY TESTING APPARATUS

Hamilton B. Bole, Sturbridge, Miss., assignor to American Optical Corporation, Southbridge, Mass.

Filed July 19, 1972, Ser. No. 273,239
Int. Cl. G01n *3/62*
U.S. Cl. 73—12 **5 Claims**



Ball dropping apparatus for testing the frangibility of lenses including a base having an elongated hollow tower extending vertically therefrom with lens supporting means in the tower adjacent the base and a receptacle for receiving and guiding a steel ball to a drop point adjacent the uppermost end of the tower. A motor driven ball elevator screw extends along one side of the tower from a point adjacent the lens supporting means to the receptacle adjacent the uppermost end of the

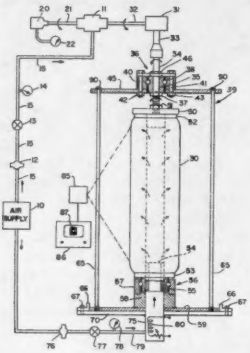
tower. An electrically operated gate releases one test ball at a time from the drop point for impact upon a lens placed upon the supporting means and each dropped ball is guided to the elevator screw for return to the upper receptacle and reuse.

3,791,194

TESTING OF FUEL FILTERS USING THERMOGRAPHY

Anthony P. Pontello, Springfield, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 25, 1972, Ser. No. 292,013
Int. Cl. G01m *3/38*; G01n *25/00*
U.S. Cl. 73—15 R **9 Claims**



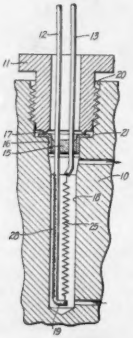
A coalescer element that functions as a filter for aircraft fuels is connected by means of a bearing surface to a heated air supply. The coalescer element is slowly rotated and scanned by means of an infrared device for sensing temperature on the outer surface of the fuel filter. The infrared scanner supplies signals to a color or black and white video screen which displays thermograms of the surface of the fuel filters. Non-uniform high temperatures on the surface of the filter, indicative that the filter is faulty, on being scanned by the scanner are displayed as a light color or light shade on the thermogram indicating a flaw in the coalescer element.

3,791,195

THERMAL CONDUCTIVITY ELEMENT

Winston C. Loe, 4851 DelMonte, La Canada, Calif.

Filed Sept. 21, 1972, Ser. No. 291,091
Int. Cl. G01n *31/00*
U.S. Cl. 73—27 R **6 Claims**



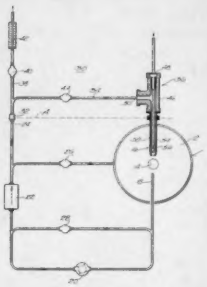
A thermal conductivity detector element is mounted within a small diameter cavity and held by support posts, one of which extends closely adjacent to a metallic cavity wall. Electrical short circuiting between the support post and wall is prevented by providing the support post or at least the portion thereof adjacent to the cavity wall with electrically non-conductive heat resistant coating such as glass or a ceramic frit. The coating is preferably fused onto the post so that it becomes an integral part of the support post.

3,791,196

DILUTION SYSTEM FOR PARTICLE ANALYZER

James M. Lepper, Jr., Los Altos, Calif., assignor to Wehr Corporation, Milwaukee, Wis.

Filed Mar. 22, 1972, Ser. No. 237,150
Int. Cl. G01n *31/00*
U.S. Cl. 73—28 **10 Claims**



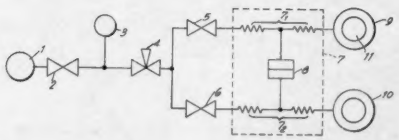
An airborne particle analyzer is provided with an adapter which affords dilution of the aerosol sample introduced into the analyzer. The adapter receives the clean exhaust air, which would otherwise be discharged into the ambient, and directs the clean air to the injector through which the aerosol sample is directed into the sensing area of the analyzer. The adapter has an adjustable exhaust to permit discharge to the ambient of a measured portion of the clean air so that a corresponding volume of new sample is drawn into the unit. The sample aerosol is injected into the center of the continuously circulating air in the unit directly at the sensing area. Regulation of the amount of fluid discharged into the ambient provides control over the amount of sample introduced into the unit for entrainment with the clean circulating air and, correspondingly, the degree of dilution of the sample.

3,791,197

AIR LEAKAGE DETECTOR USING A DIRECT PRESSURE SYSTEM

Akira Eukuda, 2-22-8 Kasuga-cho, Nerima-ku, Tokyo, Japan

Filed May 5, 1972, Ser. No. 250,724
Claims priority, application Japan, Jan. 10, 1972, 47/5878
Int. Cl. G01m *3/04*
U.S. Cl. 73—49.3 **1 Claim**



A pneumatic circuit for testing articles for leaks which includes a pair of receptacles, one for the object being tested and the other for a comparison object. The pneumatic bridge circuit includes a pair of restrictors in the charging circuit.

3,791,198

TESTING PANEL FOR INSPECTION PENETRANTS HAVING CRACKS OF CONTROLLED DEPTH AND WIDTH

James R. Alburger, 5007 Hillard Ave., La Canada, Calif.

Filed Nov. 27, 1972, Ser. No. 309,690
Int. Cl. G01n *11/00, 19/08*
U.S. Cl. 73—53 5 Claims

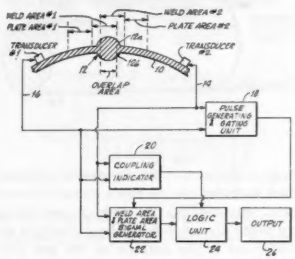
A test panel which may be used for evaluating inspection penetrant crack detection performance, comprising essentially a soft, malleable metal substrate coated with a brittle surface layer of controlled thickness within the range of from about 5 microns to 50 microns, said brittle layer having a pattern of craze cracks which are generated by a mechanical stretching of the panel to a point where the average crack width falls within the range of values from about 0.5 micron to 20 microns.

3,791,199

ULTRASONIC INSPECTION METHOD AND APPARATUS

James M. Toth, Euclid, and Tyler W. Judd, Chardon, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Aug. 1, 1969, Ser. No. 846,819
Int. Cl. G01n *29/04*
U.S. Cl. 73—67.9 10 Claims



Testing method and apparatus, incorporating a pair of transducers positioned on opposite sides of a weld seam. The transducers are alternately energized, and signals from the transducers are gated to develop signals representative of defects in various regions of the workpiece under test. Individual references are established for the different regions, and the signals are compared with the associated references. Output signals representing major defects are generated in accordance with various relationships of signals from the different regions of the workpiece.

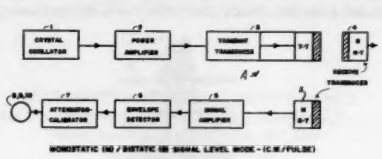
3,791,200

FLUID POLLUTION MONITORING APPARATUS AND METHOD

Harbhajan S. Hayre, 10 Legend Ln., Houston, Tex.

Continuation-in-part of Ser. No. 43,123, June 3, 1970, abandoned. This application Sept. 9, 1971, Ser. No. 179,090
Int. Cl. G01n *29/02*
U.S. Cl. 73—67.1 7 Claims

A new and improved method and apparatus for monitoring fluids to determine the presence of pollutants in the fluid and further to identify the type and quantity of pollutants in the fluid by analysis of the acoustic impedance properties of the fluid.

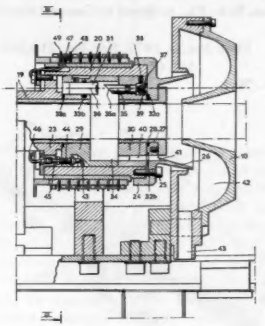


3,791,201

ULTRASONIC TESTING DEVICE

Jacques Dory, Meaux, France, assignor to Realisations Ultrasoniques, Paris, France

Filed Aug. 19, 1972, Ser. No. 173,123
Claims priority, application France, Aug. 21, 1970, 7030710
Int. Cl. G01n *29/04*
U.S. Cl. 73—67.8 S 3 Claims



Improvement to devices for ultrasonic testing and measurement of a cylindrical product by helicoidal exploration of the product.

A rotary head comprising transducers placed in a radial chamber is so positioned that each transducer faces a mirror and that the ultrasonic ray is reflected at a suitable angle on to the part under test, the chamber remaining filled with water by centrifugal force.

For application to dimensional testing and fault-seeking in industrially manufactured tubes or bars.

3,791,202

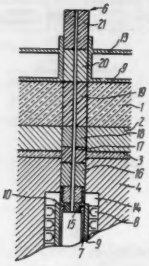
DIFFERENTIAL MICROCALORIMETER

Alfred Alfredovich Vichutinsky, ulitsa Vavilova, 86, kv. 213, and Boris Jurievich Zaslavsky, Bolshaya Dorogomilovskaya, 56, kv. 25, both of Moscow, U.S.S.R.

Filed Feb. 23, 1972, Ser. No. 228,659
Int. Cl. G01k *17/00*; G01n *25/20*
U.S. Cl. 73—15 B 1 Claim

A differential microcalorimeter employs a thermostat which accommodates a device for temperature equalization in the thermostat, the device accommodating a detector block with measuring cells symmetrically arranged in relation to a longitudinal axis of the device. In each measuring cell provision is made for a calorimetric cell holder having a longitudinal axis and composed of a plurality of heat conducting and insulating material layers disposed one above another in the direction of the longitudinal axis of the calorimetric cell holder. The material of each layer and the sequence of the layers cor-

respond to the materials of the thermostat, the temperature equalizing device, the detector block and the measuring cell



when the calorimetric cell holder is inserted into measuring cells, thereby effecting the closure of the temperature fields around the measuring cells.

3,791,203

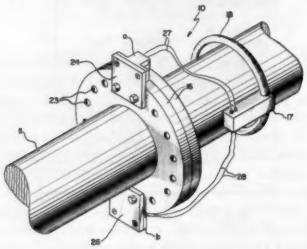
METHOD FOR MEASURING TORSIONAL VIBRATION

Keith E. Rice, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed Jan. 3, 1972, Ser. No. 214,907

Int. Cl. G01n *29/00*

U.S. Cl. 73—70.1 **3 Claims**



A method for measuring torsional vibration of a rotating horizontal shaft having no free end for attachment thereto. A pair of matched accelerometers are diametrically mounted on a hub of the shaft and their summed outputs analyzed to obtain a representative value of the torsional vibration in the rotating shaft. The diametric relationship of the pair eliminates any error which would be introduced by the effects of gravity acting on a single accelerometer.

3,791,204

ROLLING MILL FORCE MEASURING APPARATUS

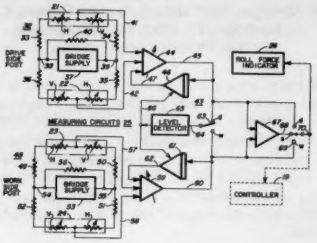
Harold A. List, and Jack H. Baker, both of Bethlehem, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Aug. 28, 1972, Ser. No. 283,995

Int. Cl. G01l *1/22*; G01b *7/18*

U.S. Cl. 73—88.5 R **4 Claims**

A means for making a simple and economical roll force measurement on rolling mill stands. A strain gage consisting of a half-bridge of vertical and horizontal semiconductor strain elements is cemented to opposing strain sites on a given post of both side frames of a rolling mill stand. These half-bridges are wired into a full-bridge strain gage circuit for each post which is responsive to post strain as a function of roll force, but is not responsive to bending moments in the post. Thermal variations affecting strain gage sensitivity are compensated for by energizing each full-bridge circuit with a separate constant current source. Thermal and mechanical drift affecting strain gage zero are compensated for by automatically nulling amplified strain gage output signals by electronic means during the absence of a workpiece in the rolling mill stand. Roll force



signals from individual posts, or their sum, are selectively fed to a utilization device such as a roll force indicator or controller.

3,791,205

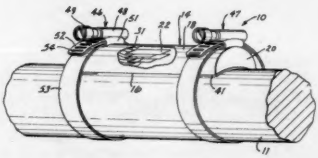
POTTED STRAIN GAUGE

Douglas B. Hooker, 924 Wheaton, Kalamazoo, Mich.

Filed Feb. 4, 1972, Ser. No. 223,479

Int. Cl. G01b *7/18*

U.S. Cl. 73—88.5 R **13 Claims**



A strain gauge construction for removable attachment to a test piece which includes one or more electrical strain gauge elements located intermediate the ends of, and encapsulated in, an elongate protective member. The protective member is preferably contoured to the surface of the test piece to be monitored. Abrasive gripping elements located remotely from the strain gauge element are interposed between the ends of the protective member and the surface of the test piece. A clamp is provided opposite each abrasive gripping element for fixing the ends of the protective member to the test piece, whereby a change in the axial dimension of the test piece results in a corresponding change in the length of the protective member and in the output of the strain gauge elements. In a modified embodiment, the change in length of the protective member is substantially concentrated in the zone occupied by the strain gauge elements for multiplying the output of the strain gauge construction.

3,791,206

FORCE-MEASURING SYSTEMS

Rudolf Grasman, and Walter Hell, both of Vienna, Austria, assignors to Waagner-Biro Aktiengesellschaft, Vienna, Austria

Filed Sept. 15, 1972, Ser. No. 289,318

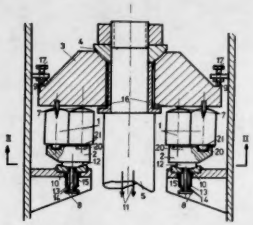
Claims priority, application Austria, Sept. 17, 1971, 8120/71

Int. Cl. G01l *1/26*

U.S. Cl. 73—141 R **9 Claims**

A force-measuring system capable of converting a tensile force into a compressive force. A pulling force is applied to a crosshead which is capable of rocking freely with respect to the axis along which the pulling force extends, and this crosshead applies the pulling force to a plurality of pressure-

measuring cells which are arranged uniformly in groups around the axis of the pulling force. The groups of pressure-measuring cells respectively engage supports which are freely tiltable and which are in turn supported by a stationary supporting structure, so that in response to the application of the pulling force to the crosshead the plurality of cells are capable of measuring the pulling force while being placed in compression.



3,791,207

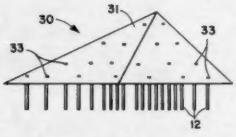
WIND TUNNEL MODEL AND METHOD

Charlie M. Jackson, Jr., Yorktown, and Dallas G. Summerfield, Hampton, both of Va., assignors to The United States of America as represented by the National Aeronautics and Space Administration, Washington, D.C.

Filed June 19, 1972, Ser. No. 263,815

Int. Cl. G01m 9/00

U.S. Cl. 73—147 **8 Claims**



A wind tunnel model having pressure measurement orifices formed integrally therein and a process for making same.

3,791,208

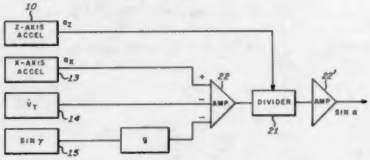
ANGLE OF ATTACK COMPUTER

Harry Miller, Scottsdale, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 873,044, Oct. 31, 1969. This application Mar. 16, 1971, Ser. No. 124,690

Int. Cl. G01c 21/10

U.S. Cl. 73—180 **8 Claims**



Apparatus for providing a measure of the true angle of attack of an aircraft without external probes or vanes, which measure is derived from computations involving measurements of longitudinal and normal accelerations of the aircraft in conjunction with air data derived computations of vertical speed and true airspeed. Supplementary outputs of the angle of attack computer are instantaneous vertical speed of the aircraft which is accurate under pitch and roll maneuvers, true flight path angle, and acceleration of the craft along the flight path.

3,791,209

HIGH TEMPERATURE RECORDING LANCE

William Carl Norburn, 1201 N. 35th St., Allentown, Pa.

Filed Nov. 11, 1971, Ser. No. 197,869

Int. Cl. G01k 7/02, 1/14

U.S. Cl. 73—359 **2 Claims**

An expendable recording lance or probe adapted for immersion in hot baths such as molten metals or salts and for mounting over the end of an elongated lance holder containing wires for interconnecting the lance with an electrical device for converting electrical information obtained from the lance to useful information. The lance includes an elongated hollow tube carrying a recording device at its front end and covered by a metallic sheath projecting beyond the front end of the tube over the recording device to protect the recording device as the lance is plunged into a hot bath.

3,791,210

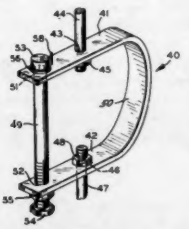
CABLE TENSION MEASURING DEVICE

Lucian W. Taylor, San Jose, Calif., assignor to Velcon Filters, Inc., San Jose, Calif.

Filed May 17, 1972, Ser. No. 254,094

Int. Cl. G01l 5/06

U.S. Cl. 73—143 **5 Claims**

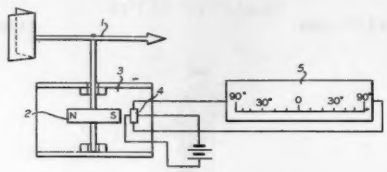


A cable tension measuring device which utilizes the relative movement of its component members under tension to indicate the point at which a desired cable tension is reached. In one form the device uses the elongation of a cylinder under tension to release a collar held between the cylinder ends. In an alternative form, the device uses the separation of the sides of a U-shaped body under tension to prevent the movement of the indicating means.

3,791,211
WIND DIRECTION INDICATOR FOR SAILBOATS

Franz Xaver Dobesch, Villingen, Germany, assignor to VDO Tachometer Werke Adolf Schindling GmbH, Frankfurt am Main, Germany

Filed Aug. 9, 1971, Ser. No. 170,059
Int. Cl. G01w 1/00
U.S. Cl. 73—188 2 Claims

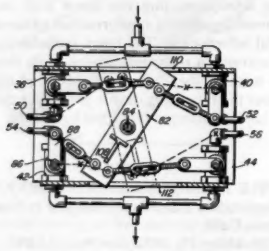


A wind direction indicator for sail boats, which comprises a vane. A rotatably mounted permanent magnet is connected with the vane and is adapted to operate as a measuring value indicator. A controllable semi-conductor is controlled by the magnetic field of the permanent magnet in dependency upon the wind direction to the midship line of said boat.

3,791,212
FLUID METERING APPARATUS

Wayne A. Blackburn, 240 Oregon Ave., and Sevall W. Hemness, 313 GW Ave., both of Lovell, Wyo.

Filed Jan. 7, 1972, Ser. No. 216,059
Int. Cl. G01f 3/16
U.S. Cl. 73—251 8 Claims



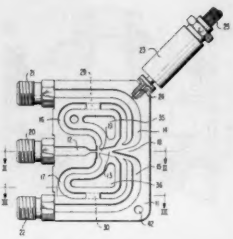
A fluid metering apparatus for dispensing additives into petroleum products or the like, said apparatus comprising a cylinder with fluid handling ports at opposite ends, a piston reciprocally mounted in the cylinder, a counter operatively connected to the piston to record the number of piston strokes indicative of the volume of fluid dispensed, a plurality of on-off valves controlling the flow of fluid through the cylinder, and a snap-action over-center mechanism interconnecting the piston with the valves by way of adjustable couplings to assure simultaneous actuation of the valves.

3,791,213
TEMPERATURE FEELER

Gerhard Walliser, Waiblingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Oct. 21, 1971, Ser. No. 191,481
Claims priority, application Germany, Oct. 30, 1970, 2053319
Int. Cl. G01k 11/22
U.S. Cl. 73—339 A 12 Claims

A temperature sensing device for hot gases, which consists of a pneumatic oscillator provided with an inlet channel, a diffusor, and a wedge projecting into the diffusor which is adjoined by two outlet channels, from which branch off two return channels leading to the inlet side of the diffusor whereby the oscillator consists of a lamella packet into which

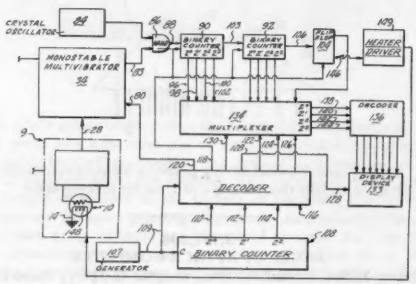


are worked the channels and of two cover plates which are provided at the sides facing the lamella packet with recesses through which a portion of the gases is conducted whose temperature is to be measured.

3,791,214
DIGITAL CLINICAL THERMOMETER

Arlie L. Keith, 1815 Gerda Ter., Orlando, Fla.

Filed Aug. 10, 1971, Ser. No. 170,468
Int. Cl. G01k 7/24
U.S. Cl. 73—362 AR 7 Claims



A counter is preset to a count that represents a temperature slightly below a range of clinical interest. The counter is incremented by a gated oscillator, in response to the output of a thermistor bridge, thereby augmenting the content of the counter so that its count is representative of the temperature of the thermistor. The content of the counter is displayed visually, in a serial digit-by-digit manner, on a display device. The time required for the thermistor to reach the temperature that is being measured is shortened by preheating the thermistor to a temperature within the range of clinical interest.

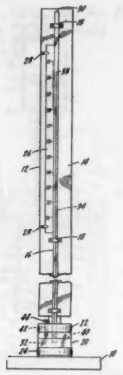
3,791,215
BAROMETER

Medard W. Welch, 1111 Sheridan Rd., Winnetka, Ill.

Filed Sept. 25, 1972, Ser. No. 291,672
Int. Cl. G01l 7/20
U.S. Cl. 73—385 2 Claims

This is a barometer of the mercury column type in which the diameter of the column is sufficiently small such that when the level changes, due to changes in atmospheric air pressure, the

change in the level of the pool surface will be less than the accuracy within which conventional barometers can be read.



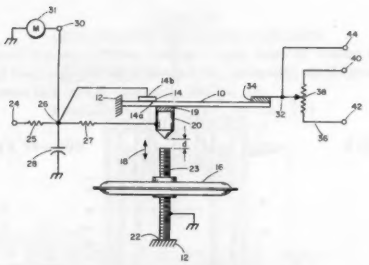
Thus the scale opposite the top of the column does not have to be adjusted or "zeroed" to the pool level change.

3,791,216

PIEZOELECTRIC DRIVEN UNLOADED PRESSURE SENSOR

William C. Blanchard, Baltimore, Md., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sept. 25, 1972, Ser. No. 292,217
Int. Cl. G01l 9/08
U.S. Cl. 73—398 R **5 Claims**



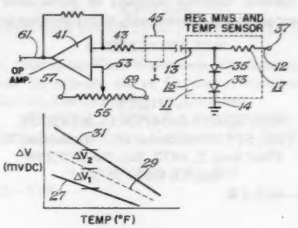
A d.c. voltage is applied through a series resistor to a capacitive piezoelectric device which is part of a cantilevered beam. The beam is thus made to deflect from a starting position until it contacts a grounded aneroid cell thereby partially discharging the piezoelectric device so that it moves back slightly toward the starting position sufficiently to break the ground contact. The capacitive piezoelectric device is thus alternately charged and discharged as the beam alternately makes and breaks ground by contact with the grounded aneroid cell. Since the expansion of the aneroid cell is in response to ambient pressure, the beam deflection as well as the voltage impressed across the piezoelectric device are related to ambient pressure.

3,791,217

TEMPERATURE SENSOR EMPLOYING MARRIED DIODE JUNCTION MEANS

Beauford F. Stout, Grandview, and George W. Hann, Fort Worth, both of Tex., assignors to Kodata, Inc., Fort Worth, Tex.

Filed Nov. 8, 1971, Ser. No. 196,269
Int. Cl. G01k 7/24; H01l 1/22
U.S. Cl. 73—342 **5 Claims**



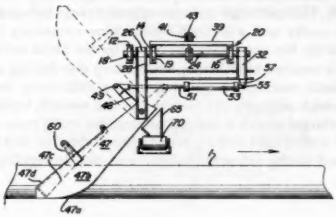
An improved system employing a plurality of economical, linear and interchangeable temperature sensors, characterized by (1) diode junction temperature sensors that include a plurality of serially connected diode junctions that are preselected to have a predetermined standard operating curve, at a constant current within the range of −100° F. to +350° F.; and (2) power supply means and regulator means for maintaining a substantially constant current flowing through the diode junction temperature sensor. Also disclosed are specific embodiments including: (1) temperature sensors connected with an electrical common and employing a single readout lead carrying a signal that is relatively insensitive to the length of the lead, and (2) multiplexing equipment for monitoring a plurality of such readout leads.

3,791,218

APPARATUS FOR REMOVING SAMPLES OF PARTICULATE MATERIALS FROM AN ENDLESS BELT CONVEYOR

Fred A. Pennington, Harrisburg, Pa., assignor to D & P Minerals, Inc., Harrisburg, Pa.

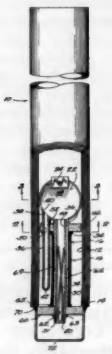
Filed Jan. 5, 1972, Ser. No. 215,584
Int. Cl. G01n 1/10
U.S. Cl. 73—423 R **6 Claims**



Representative quantities of ores and other particulate materials are removed, when desired, from the upper flight of a substantially horizontally disposed, transversely concave, endless belt conveyor by a relatively narrow elongate scoop which is pivotally suspended from above with its lower end normally extending in an upstream direction and into close proximity, or contact, with the surface of the upper flight of the endless belt conveyor. After the desired sample has been received through an inlet port in the elongate scoop, the normally lower end of the latter is raised and the particulate materials are permitted to flow by gravity through the

remainder of the elongate scoop and discharged through an outlet port in the normally upper end and fed onto a cross-conveyor which transfers the sample to wherever desired. The raising of the free end of the pivotally mounted elongate scoop causes it to move through an arc which extends longitudinally of the endless belt conveyor; and additional pivotal means are provided for moving the lower end of the elongate scoop through an arc which extends transversely with respect to the endless belt conveyor. Through this last-named means the lower end of the elongate scoop may be so adjusted that the inlet port thereof receives samples of particulate material from different positions transversely of the moving stream.

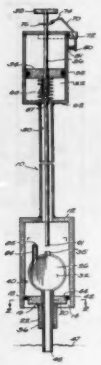
3,791,219
IMMERSION SAMPLE CARTRIDGE
Richard A. Falk, 519 Westminster Dr., Waukesha, Wis.
Filed Aug. 2, 1972, Ser. No. 277,190
Int. Cl. G01n *1/12*
U.S. Cl. 73—425.4 R **7 Claims**



A sample mold cartridge for a molten metal sampling lance is pre-assembled prior to insertion in the hollow interior of a tubular lance used for holding the cartridge during immersion in a bath. The cartridge includes opposed mold halves defining a mold cavity and a smooth walled tube extending into the mold cavity for conveying the metal to the mold cavity. The parts are secured together by a refractory disc having an aperture which receives mold parts and a refractory insulative shield which supports the free end of the smooth walled tube. A paperboard sleeve arranged around the mold parts and the smooth walled tube and located between the disc and shield is cemented to the refractory shield and disc to rigidity the assembly.

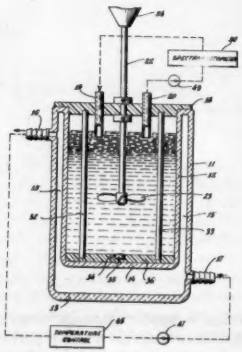
3,791,220
PNEUMATIC METAL SAMPLER
Richard A. Falk, 519 Westminster Dr., and William R. Falk, 1505 Chapman Dr., both of Waukesha, Wis.
Filed Aug. 11, 1972, Ser. No. 280,010
Int. Cl. G01n *1/12*
U.S. Cl. 73—425.6 **8 Claims**

Apparatus for obtaining a sample of molten metal includes a sample cartridge with an entry port for receiving the sample and a lance with a cartridge receiving chamber which holds the cartridge while a sample is taken. The lance chamber is sealed by a gasket on the sample cartridge and a pump or other pressure reducing device in the lance in communication



with the chamber lowers the pressure in the cartridge to cause a flow of molten metal into the cartridge interior.

3,791,221
DISSOLUTION TESTING DEVICE
Lawrence Kirschner, Flanders; Thomas Simon, Succasunna, and William A. Campbell, Chester, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.
Filed Apr. 7, 1972, Ser. No. 242,168
Int. Cl. B01f *1/00*
U.S. Cl. 73—432 R **12 Claims**



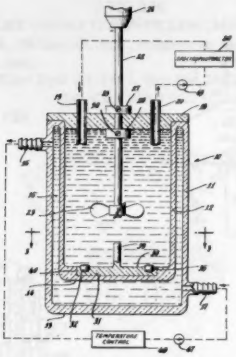
The specific disclosure provides a dissolution rate testing device for tablets and capsules comprising a closed chamber having a solution medium therein, a removable holder positioned in the bottom of the chamber for at least one tablet or capsule, and an impeller for circulating the solution medium about the at least one tablet or capsule so that the dissolution rate can be observed.

3,791,222

DISSOLUTION TESTING DEVICE

Frank Goodhart, Morristown, and William A. Campbell, Chester, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Apr. 7, 1972, Ser. No. 242,170
Int. Cl. B01f 1/00
U.S. Cl. 73—432 R 7 Claims



The specific disclosure provides a dissolution rate testing device for tablets and capsules comprising a closed chamber having a solution medium therein, a removable holder positioned in the bottom of the chamber for at least one tablet or capsule, and an impeller for circulating the solution medium about the at least one tablet or capsule so that the dissolution rate can be observed.

ERRATUM

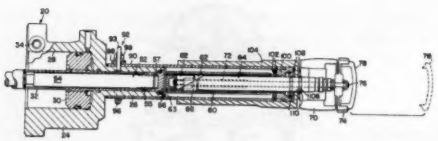
For Class 73—519 see:
Patent No. 3,791,224

3,791,223

ADJUSTABLE STEERING COLUMN

Richard Treichel; Cleon Arthur Wood, both of Cedar Falls, and Fredrick Charles Christenson, Janesville, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed June 28, 1972, Ser. No. 267,181
Int. Cl. B62d 1/18
U.S. Cl. 74—493 2 Claims



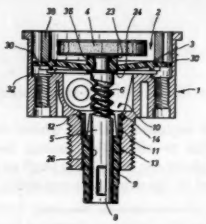
A tractor has a hydrostatic steering system which includes a hydraulic cylinder and a valve package mounted in a housing disposed immediately in front of the tractor instrument panel. A steering shaft extends upwardly and rearwardly from the housing through the instrument panel and has a steering wheel mounted on its rearward end, the forward end of the steering shaft being connected to the steering valves so that rotation of the shaft actuates the valves. The housing is mounted on a transverse pivot, which permits vertical swinging adjustment of the steering shaft and the steering wheel about the axis of the pivot, a latching device being provided below the instrument panel to lock the housing in the desired position. The rearward part of the shaft, which projects from the housing, includes telescoping portions, which are lockable in different relative axial positions to vary the length of the steering shaft. The locking device includes a wedge member, which is forced into locking engagement with the two telescoping shaft portions in response to rotation of a rod, which is threadably connected to the wedge member and extends rearwardly through the shaft to a knob adjacent the hub of the steering wheel.

3,791,224

APPARATUS FOR MOUNTING THE MAGNET SHAFT OF A SPEEDOMETER

Karl Sinz, Ditzingen; Karl Nirenberg, Neuhausen, and Hans Repphun, Kirchheim, all of Germany, assignors to Moto Meter GmbH, Leonberg/Wurtt., Germany

Filed Oct. 2, 1972, Ser. No. 294,099
Claims priority, application Germany, Oct. 1, 1971, P 21 49 146.3
Int. Cl. G01p 1/04, 3/49
U.S. Cl. 73—519 13 Claims



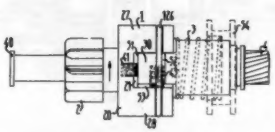
In a measuring device such as a speedometer, the magnet shaft with an attached magnet is rotatably mounted within a cylindrical plastic bushing mounted in the speedometer body in order to secure the shaft against any radial movement. A plastic holding disc is attached to the magnet shaft and then secured within the speedometer body so as to prohibit any axial displacement of the shaft.

3,791,225

POSITIVE CONTROL ENGINE STARTER

Jules Henri Molliet, 2, rue Traversiere, 21 Arnay-le-Duc, France

Filed Dec. 10, 1971, Ser. No. 206,706
Claims priority, application France, Dec. 15, 1970, 7045926
Int. Cl. F02n 15/06
U.S. Cl. 74—7 R 7 Claims



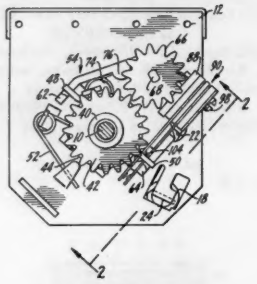
A positive control engine starter with a novel coupling between the drive pinion and a helical-spline drive shaft, the coupling including male and female coupling elements cooperating with one another over an axial clearance and an angular clearance. The coupling parts are axially and angularly spring-biased against closing of the clearance gaps, thereby allowing the pinion to yield axially and angularly when tooth collision occurs during engagement. The same spring bias facilitates the pinion retraction after engine firing, by temporarily eliminating the tooth pressure on the gears and by initiating the retracting motion of the male coupling part on the drive shaft.

3,791,226

SLIP CLUTCH FOR TELEVISION FINE TUNING MECHANISM

Norman D. Cappelle, Arlington Heights, and Henry H. Tap, Cary, both of Ill., assignors to Oak Industries Inc., Crystal Lake, Ill.

Filed Jan. 22, 1973, Ser. No. 325,240
Int. Cl. H03j *1/08, 1/12, 1/14*
U.S. Cl. 74—10.8 **13 Claims**



A slip clutch for the fine tuning mechanism of a television tuner.

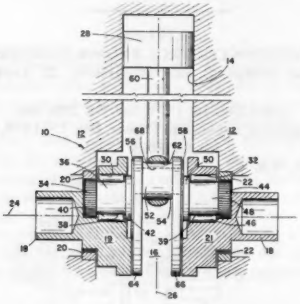
The slip clutch includes a slider which may be slidably moved into position to effect fine tuning, and either a coil spring positioned about the fine tuning shaft or mating beveled surfaces positioned on the drive gear and slider.

3,791,227

VIBRATION FREE PISTON ENGINE

Myron E. Cherry, P.O. Box 4213, Las Cruces, N. Mex.

Filed Apr. 21, 1972, Ser. No. 245,836
Int. Cl. F16h *37/12*
U.S. Cl. 74—52 **5 Claims**



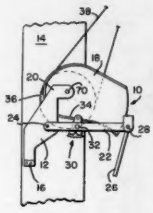
In combination with an apparatus having at least one stationary ring gear and one planet gear for each ring gear for converting rotary motion into rectilinear reciprocating motion of a reciprocating member attached to the pitch circle of the said planet gear by rotary attach means, a planet gear swallowing counterweight for each planet gear having mass sufficient to offset that of the reciprocating member, the counterweight having a cross sectional shape which is quadrilaterally symmetrical about its center of gravity, the center of gravity of the counterweight being located on a line passing through the pitch circle of the planet gear, diametrically opposite the reciprocating member and offset from the axis of the planet gear by a distance equal to one half the pitch diameter of the planet gear for substantially eliminating vibration therefrom while simultaneously providing offset counterbalancing for the reciprocating member.

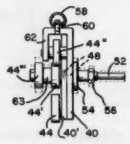
3,791,228

CAMMING MEANS

Gary E. Raymond, P.O. Box 531, Kenvil, N.J.

Filed Feb. 8, 1973, Ser. No. 330,501
Int. Cl. F16h *25/08*
U.S. Cl. 74—54 **10 Claims**





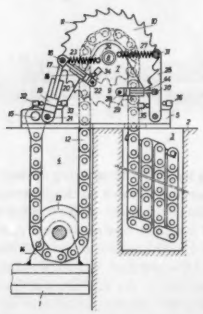
In the depicted embodiment, the means include a cam plate assembly, and a crank arm, rotatably and pivotally coupled to a mounting plate, respectively, with a cam follower assembly pivotally carried by the crank arm. The assembly has a pair of rollers thereon which engage opposite sides of a camming ridge formed on the cam plate assembly. The follower assembly defines a yoke, of pivotally coupled limbs, which slidably carries one of the rollers, and has a spring which urges the one roller, and a shaft upon which it is mounted, towards the other roller. Thus, a constant "nipping" contact of the rollers, in follow of the ridge, is assured.

3,791,229

LIFTING DEVICE FOR LIFTING AND LOWERING HEAVY LOADS

Heinz Liedtke, Neuss, Germany, assignor to Schiess Aktiengesellschaft, Dusseldorf-Oberkassel, Germany

Filed May 24, 1972, Ser. No. 256,450
Int. Cl. F16h *27/02*
U.S. Cl. 74—128 **7 Claims**



A power transmitting device, especially for lifting heavy loads, in which a chain is connected to the load and leads up-

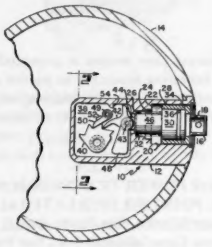
wardly therefrom and about a sprocket wheel. A ratchet wheel is coaxial with and nonrotatably connected to the sprocket wheel and pawls are provided adjacent the ratchet wheel for driving the ratchet wheel in load lifting direction or for permitting controlled rotation of the ratchet wheel in load lowering direction. Fluid motors are connected to the pawls for the actuation thereof. A plurality of sprockets and ratchet wheels can be provided and operated in synchronism.

3,791,230

PRESSURE OPERATED INDEXING MECHANISM

George Webb, Richmond, Ind., assignor to Avco Corporation, Richmond, Ind.

Filed June 23, 1972, Ser. No. 265,437
Int. Cl. F16h *27/02*
U.S. Cl. 74—128 **8 Claims**



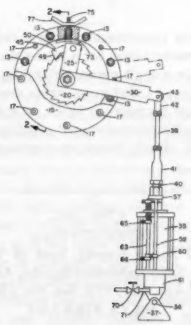
A pressure operated indexing mechanism to provide remote indexing of a mechanism through the use of fluid pressure pulses is disclosed. The device provides a means where a munition or other device can be indexed or set while in a closed container. A pair of telescoping pistons are acted on by externally applied pressure. The primary piston will advance the mechanism one position for each pulse of a predetermined pressure. Pressures higher than another and greater predetermined pressure will cause the secondary piston to cause the mechanism to reset to the start or safe position.

3,791,231

TURBINE TURNING MECHANISM

Carl H. Geary, Greensburg, Pa., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 3, 1972, Ser. No. 240,603
Int. Cl. F16h *27/02*
U.S. Cl. 74—142 **3 Claims**



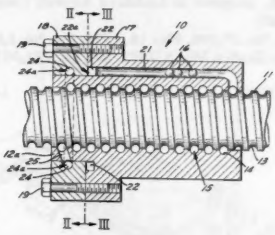
A fluid operated piston and cylinder structure is employed to impart intermittent rotation to a steam turbine subsequent to shutdown. Preferably the motion transmitting means between the piston and cylinder structure and the turbine shaft consists of a ratchet wheel fixed to the shaft and a pawl operated by the piston and cylinder. Means is provided to restrain movement of the pawl into engagement with the ratchet when the turbine is operating. Preferably the pawl restraining means is operated automatically upon the turbine reaching a predetermined speed.

3,791,232

ADJUSTABLE BALL LEAD NUT

Jesse Norman Helmer, Rt. 1, Box 241, Lake City, Mich.

Continuation-in-part of Ser. No. 157,377, June 28, 1971, abandoned. This application Feb. 12, 1973, Ser. No. 332,011
Int. Cl. F16h *55/28, 55/18*
U.S. Cl. 74—459 **12 Claims**



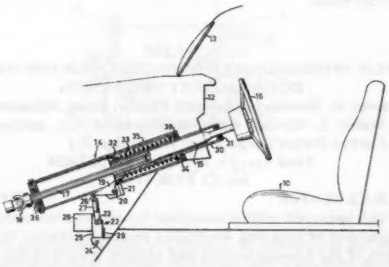
In combination, an adjustable ball lead nut and a ball lead screw having complementary channels or grooves cooperating to define a helical duct, an adjustment disc mounted at one end of the nut and adapted to rotate with respect thereto over a limited angle, the lead nut and adjustment disc being provided with complementary channels or grooves cooperating to define an adjustment loop duct being in series with the helical duct, and a plurality of ball bearings disposed within the ducts, rotation of the adjustment disc in one direction causing the adjustment loop duct to decrease in length, thereby bringing the ball bearings into mutual engagement and providing compensation for wear of said ball bearings. Additional structure is provided to facilitate the movement of ball bearings through the various ducts.

3,791,233

COLLAPSIBLE VEHICLE-STEERING SYSTEMS

Lars Olof Bane, Goteborg, Sweden, assignor to AB Volvo, Goteborg, Sweden

Filed Nov. 6, 1972, Ser. No. 303,946
Int. Cl. B62d *1/18;* **G05g** *17/00*
U.S. Cl. 74—492 **12 Claims**



An improved collapsible vehicle-steering system comprising a steering wheel and steering wheel shaft assembly extending

between the steering wheel and means for transmitting steering wheel movement to the vehicle wheels. The shaft assembly is divided into an upper section and a lower section arranged for coaxial movement relative to each other. The upper shaft section carries the steering wheel and is freely movable axially from a first steering position to a second safe position and is releasably held in its first steering position by a latch means which co-acts with means sensitive to vehicle retardation forces. The means sensitive to vehicle retardation forces is adapted to actuate the upper shaft section latching means at forces exceeding a predetermined magnitude, to permit axial movement of the upper shaft section relative the lower, from said first position to said second position.

3,791,234

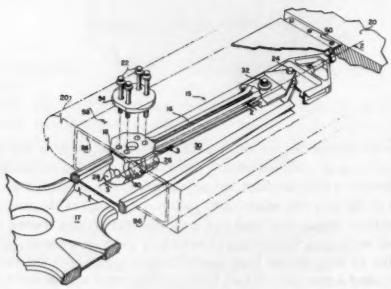
A RETENTION MEMBER

Howard Kastan, Northridge, and Joe C. Pena, La Canada, both of Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Division of Ser. No. 38,396, May 18, 1970, Pat. No. 3,695,779. This application May 8, 1972, Ser. No. 251,093

Int. Cl. F16c *5/00*

U.S. Cl. 74—579 R **14 Claims**



A blade retention member which is compressible and torsionable in installation and operation of a rotor control system, the torsional stiffness of the member decreasing with increasing rotor blade speed, the compressible stress not exceeding the strength of the material out of which the member is fabricated. Its inboard end is fixedly connected to either the rotor blade or a movable hub enveloping it at its inboard end, while its outboard end is fixedly connected to the fixed hub or extension thereof in the rotor system. Means are also provided in the system for isolating bearing means supporting the blade from the blade retention member. The member itself comprises a plurality of circumferentially spaced parallel rails spacedly disposed radially equidistant and arcuately about from a common centerline coincident with the feathering axis for the blade.

3,791,235

SPLIT INTERMEDIATE HOUSING SECTION FOR MULTI-ROTOR ROTARY MECHANISM

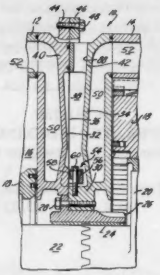
George H. Woodier, Ringwood; Charles Jones, Hillsdale, and Walter L. Hermes, Cedar Grove, all of N.J., assignors to Curtiss-Wright Corporation, Woodridge, N.J.

Filed Apr. 19, 1973, Ser. No. 352,438

Int. Cl. F16h *57/02*

U.S. Cl. 74—606 **18 Claims**

The improved split intermediate housing section comprises a plurality of fastening assemblies disposed between the two parts of the housing section and radially inward of the outer periphery of the housing section. Each assembly has a fixed camming surface on one part of the housing section and an adjustable camming surface on the other part of the housing section disposed to abut the fixed camming surface. A bolt coacts with the adjustable camming surface to move the latter relative to the fixed camming surface and develop a reactive, axially directed force drawing the two parts of the housing sec-



tion together. Access port means is provided in the housing section for each fastening assembly to permit a tool to extend from a point exteriorly of the housing section, in the housing section to engagement with the bolt for rotation.

3,791,236

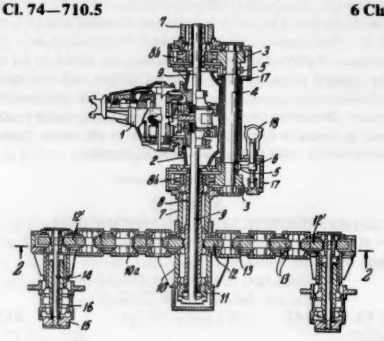
BRIDGE FOR POWER TRANSMISSION FROM A CENTRAL POINT TO TWO LATERAL POINTS

Jose Luis Whitaker Ribeiro, Sao Paulo, Brazil, assignor to Engesa-Engenheiros Especializados S.A., Sao Paulo, Brazil

Continuation of Ser. No. 115,608, Feb. 16, 1971, abandoned. This application Jan. 26, 1973, Ser. No. 326,821

Int. Cl. F16h *1/44*

U.S. Cl. 74—710.5 **6 Claims**



Bridge for power transmission from a central point to two lateral points, a transmission for a heavy duty vehicle, including a differential two shaft means driven by the differential, a pair of wheel supports and gear trains connecting the shaft means to the wheel supports; a blocking mechanism, with tubular axle shaft and at least one gear capable of rotating on the central shaft, and clutch means to connect said gear to the central shaft.

3,791,237

DIFFERENTIAL

Shin Kitano, and Tooru Kagata, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi Pref., Japan

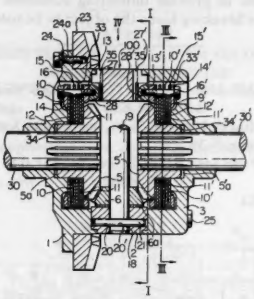
Filed Apr. 21, 1971, Ser. No. 136,139

Int. Cl. F16 h *1/44*

U.S. Cl. 74—711 **2 Claims**

A differential applicable to an automobile in which variations between the speeds of the wheel axles is regulated in accordance with the actual speed of the axles compared with the

speed of the differential housing by a cam means which translates the variations in speed of the wheel axles compared with the speed of the differential housing into porportional increases in the pressure applied to a multiple disc friction



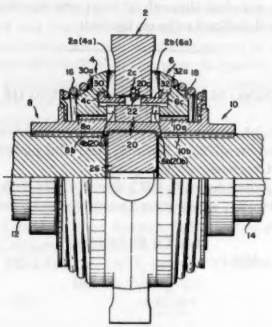
clutch means for producing a resultant braking force, which force returns back to the cam means and is thus translated again into further pressure increases to the clutch means to cause the clutch discs to engage more tightly to each other.

3,791,238

DIFFERENTIAL MECHANISM OF THE HOLDOUT RING TYPE

Ronald D. Bokovoy, Bloomfield Hills, Mich., assignor to Boise Cascade Corporation, Boise, Idaho

Filed Aug. 4, 1972, Ser. No. 276,681
Int. Cl. F16h *35/04*
U.S. Cl. 74—650 **6 Claims**



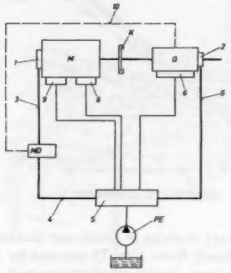
A differential mechanism of the type including a pair of annular driven clutch members spring-biased into driven engagement with an annular central driving member arranged colinearly therebetween, and holdout ring means operable when one of the driven shafts overruns the other for maintaining the corresponding driven clutch member in a disengaged condition relative to the driving member, characterized in that each of the axially split resilient holdout rings is normally biased radically outwardly in an expanded condition into frictional engagement with the outer side wall of the driven clutch recess in which it is rotatably supported. Pilot means contained solely within the driving member are provided for piloting the adjacent ends of the side gears upon which the driven clutch members are axially slidable. According to the preferred embodiment, the adjacent ends of the side gears are journalled in the central cam member, the spring biasing means being arranged either externally or internally of the driven clutch members. According to an alternate embodiment, the piloting is effected by a telescopic connection between the adjacent ends of the side gears.

3,791,239

VEHICLE TRANSMISSION CONTROL SYSTEM FOR VEHICLES

Friedrich Schreiner, Eichelen, Germany, assignor to Zahnradfabrik Friedrichafen AG, Postfach, Germany

Filed July 9, 1971, Ser. No. 161,171
Claims priority, application Germany, July 11, 1970, P 20 34 503.3
Int. Cl. B60k *21/00*
U.S. Cl. 74—752 C **7 Claims**



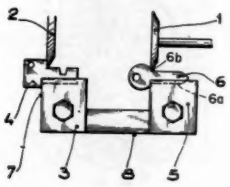
A vehicle transmission having a shiftable type of gear ratio control mechanism, is automatically operated in accordance with variations in engine speed and vehicle speed. Gear ratio shift is effected under joint control of a vehicle speed signal and an engine speed signal modulated by an amount dependent upon the gear ratio condition of the transmission.

3,791,240

METHOD OF REPRODUCING FLAT KEYS AND TOOLS USED TO THIS END

Angelo Meoni, Paris, France, assignor to Cemsa, Montreuil-sous-Bois, France

Filed Mar. 12, 1971, Ser. No. 123,736
Claims priority, application France, Mar. 19, 1970, 70.09833
Int. Cl. B23c *3/35*
U.S. Cl. 76—110 **1 Claim**

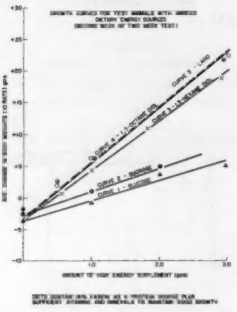


This invention relates to a method of reproducing flat keys according to their number and code, and tools used to this end, wherein a number of gauges equal to the number of the notches of the key are successively reproduced, each of these gauges having a single notch whose shape, depth and relative distance correspond to those of the key to be reproduced.

3,791,241
HIGH ENERGY FOOD SUPPLEMENTS COMPRISING LINEAR ALIPHATIC 1,3-DIOLS

John W. Frankenfeld, Atlantic Highlands, N.J., and Sanford A. Miller, Chestnut Hill, Mass., assignors to Esso Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 809,645, March 24, 1969, which is a continuation-in-part of Ser. No. 725,782, Feb. 1, 1968. This application June 30, 1972, Ser. No. 268,089
Int. Cl. A23k *1/00*
U.S. Cl. 99—2 R 9 Claims

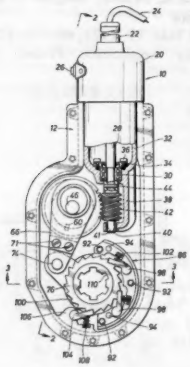


Metabolic energy sources in foods are increased by incorporating in the foods from 1 to 75 percent by wt. of a compound selected from linear aliphatic polyols an mixtures thereof. The polyols have from about five to 15 carbon atoms in the chain and hydroxy groups only on alternate carbon atoms and on at least the first and third carbon atom.

3,791,242
POWER OPERATED WRENCH MECHANISM

Alexander P. Bartusch, 40333 Central Ave., Coldsprings, Tex.

Continuation-in-part of Ser. No. 669,668, Sept. 21, 1967, abandoned. This application Mar. 20, 1969, Ser. No. 808,774
Int. Cl. B25b *17/00*, *21/00*
U.S. Cl. 81—57.13 5 Claims

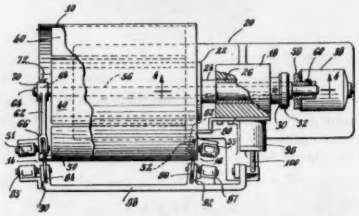


A motor operated wrench mechanism for imparting successive rotative movement to an object to which the wrench mechanism is applied. The wrench mechanism includes a motor which imparts reciprocational movement to a connecting rod through a worm gear eccentric crank shaft mechanism. The connecting rod imparts successive rotational movements to a ratchet gear through a driving mechanism including a plurality of driving pawls capable of varying the effective rotative driving stroke of the drive mechanism. A lost motion connection may be provided between the connecting rod and the ratchet drive mechanism to provide infinite variance in the length of the operative stroke of the wrench mechanism and to provide impacting actuation of the drive mechanism for breaking loose the object to be rotated.

3,791,243
METHOD AND APPARATUS FOR FORMING EDGES ON AN ENDLESS BELT

Thomas J. Holinski, Monroe, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed May 8, 1972, Ser. No. 251,046
Int. Cl. B26d *3/22*
U.S. Cl. 83—54 8 Claims

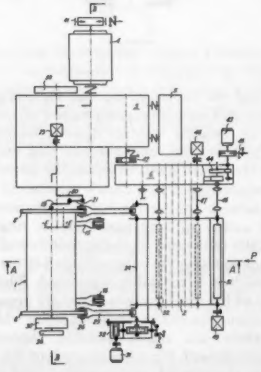


A well-defined edge is formed on an endless belt by positioning the belt on a generally cylindrically shaped mandrel with an inner surface thereof adjacent to a first stationary rotatably mounted cutter blade, advancing into engagement with an outer surface of the endless belt at a location oppositely disposed to the first cutter blade a second rotatably mounted cutter blade, rotating each of the cutter blades and rotating the mandrel through at least one revolution thereby forming a well-defined edge on the belt.

3,791,244
SHEARING MACHINE FOR CUTTING OF BAND MATERIAL

Frantisek Dofek, Zdar Nad Sazavou, Czechoslovakia, assignor to Zdarske Strojirny a slevarny, narodni podnik, Zdar nad Sazavau, Czechoslovakia

Filed July 14, 1972, Ser. No. 271,709
Claims priority, application Czechoslovakia, July 16, 1971, 71/5249
Int. Cl. B23d *25/12*
U.S. Cl. 83—305 11 Claims



A shearing machine for cutting metal bands is provided in which the cutters are synchronized with the rate of feed,

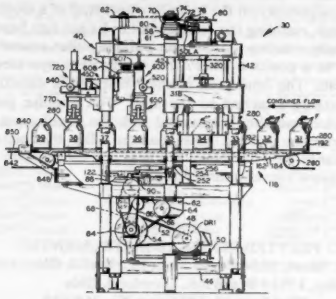
within a predetermined range of cut lengths, by imparting to the cutters a variable speed in the feed direction. A twin crank synchronizing mechanism is employed for this purpose and variations of the speed are controlled by adjustment of the eccentricity between the cranks of the twin crank mechanism.

3,791,245

MOLDED PLASTIC CONTAINER SECONDARY OPERATIONS MACHINE

Noel B. Eggert, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 93,069, Nov. 25, 1970, Pat. No. 3,716,910.
This application Nov. 28, 1972, Ser. No. 310,176
Int. Cl. B26d *5/04, 5/28*
U.S. Cl. 83—370 **14 Claims**



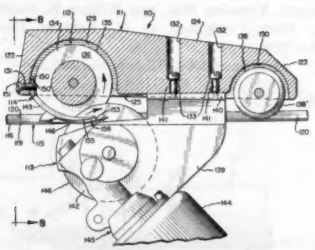
A method and apparatus is provided for performing secondary operations on plastic containers including deflashing, machining, leak detecting and dimension checking. The assemblies for performing these secondary operations are synchronized and designed to enable sequential operations to each of a continuing succession of containers to enable more and faster operations than in the past. A transfer mechanism indexes the containers between operation stations. Defective containers are rejected as the containers emerge from the processing apparatus.

3,791,246

MACHINE FOR CUTTING-SHEET-LIKE MATERIAL SUCH AS FABRIC

Casimir M. Lazickas, East Aurora, N.Y., assignor to Eastman Machine Company, Buffalo, N.Y.

Filed Feb. 26, 1973, Ser. No. 335,579
Int. Cl. B26d *1/22*
U.S. Cl. 83—375 **12 Claims**



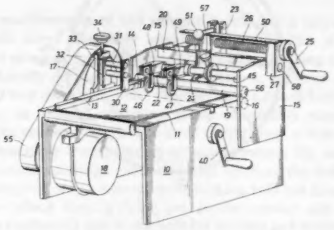
A carriage is mounted for manual movement along a slotted track and supports the peripheral cutting edge of a rotary knife within the slot. A roller is mounted on the carriage for rotation about an axis parallel to that of the rotary knife to hold a portion of material to be cut against the track and has a peripheral groove arranged to receive a portion of the rotating cutting edge of the knife. A nip is defined at the point where the cutting edge enters the roller groove to abradingly cut material arranged in its path movement. A cantilevered throat plate is preferably mounted on the carriage and has split trails at its free end to receive the cutting edge therebetween and to smooth such held material proximate the nip. The configuration of the split trails tends to insure the rotative independence of the roller and the knife.

3,791,247

PAPER TRIMMING MACHINE

Floyd H. Pretz, 1508 W. Carter, Orange, Tex.

Filed Aug. 28, 1972, Ser. No. 284,360
Int. Cl. B26d *3/12*
U.S. Cl. 83—418 **4 Claims**



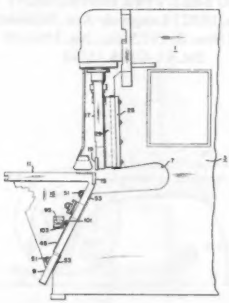
Apparatus for trimming paper having improved workpiece support and alignment structure. The machine accurately trims the workpiece by holding the workpiece accurately aligned with the cutter discs and advancing the workpiece rapidly through the cutter assembly.

3,791,248

SHEAR MACHINE KNIFE ADJUSTMENT

Eugene W. Pearson, Orinda, Calif., assignor to Canron, Inc., Oakland, Calif.

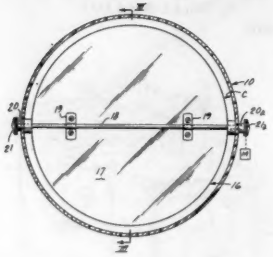
Filed Aug. 14, 1972, Ser. No. 280,193
Int. Cl. B26d *1/00, 5/08*
U.S. Cl. 83—641 **6 Claims**



In a shear machine, the lower or fixed knife which is installed in a bed or table which, in turn, is slidably supported on the front sloping edges of the machine side housings, is adjustable horizontally with respect to the upper or movable knife by an adjustable wedge assembly installed frontally, in position to elevate the bed or table along the sloping edges, to reduce the horizontal spacing between the knives. The wedge angle with respect to the horizontal, is sufficiently steep, to cause the bed or table to respond to gravitational pull as the

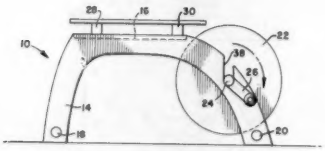
wedge adjustment is reversed, thereby to increase the horizontal spacing between the knives.

3,791,249
DRUM
Richard I. Frigo, 18 W. 224 16th St., Villa Park, Ill., and William F. Crowden, 2420 W. Berwyn Ave., Chicago, Ill.
Division of Ser. No. 103,752, Jan. 4, 1971, Pat. No. 3,724,313. This application Sept. 8, 1972, Ser. No. 287,349
Int. Cl. G10d 13/02
U.S. Cl. 84—411 3 Claims



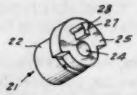
A drum or other musical percussion instrument made of a seamless cylindrical shell of an integral synthetic plastic, such as a methyl methacrylate resin, with a tone or sound modulator associated therewith comprising a one- or multi-part panel of similar transparent plastic material mounted for rotation about an axis parallel to a drum head and intersecting said shell with clearance therebetween and between the panel and the head, or heads, of the drum to permit adjustability of the panel into various angular positions relative to the plane of the head in order to modulate the sounds caused by playing on said head.

3,791,250
APPARATUS FOR SIMPLIFYING THE PLAYING OF A SONG BELL TYPE INSTRUMENT
John M. Buchman, 10327 Langmuir Ave., Sunland, Calif.
Filed Mar. 8, 1973, Ser. No. 339,155
Int. Cl. G10b 15/00
U.S. Cl. 84—483 3 Claims



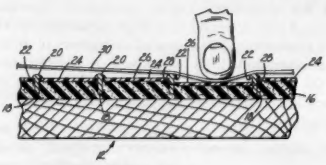
Apparatus for simplifying the playing of a song bell type instrument said apparatus including a stand having a support for the song bell instrument with a rotatable roll mounted adjacent thereto with a music sheet attached to the surface of the roll, said sheet having indicia thereon coordinated with the instrument keyboard to indicate which key is to be struck and the order for striking.

3,791,251
TIMEPIECE ESCAPEMENT
Ulrich R. Pohlmann, Chicago, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.
Filed June 5, 1972, Ser. No. 259,863
Int. Cl. G04b 1/00
U.S. Cl. 58—116 R 10 Claims



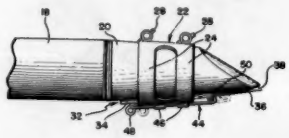
An integral impulse pin and guard roller assembly is mounted adjustably on the balance wheel staff of a clockwork escapement, enabling the escapement to be put into beat easily by simply rotating the impulse pin and roller assembly on the staff to a position where the escapement operates with equal beats. The inner end of the hairspring is directly and non-adjustably attached to the staff. The impulse pin and guard roller assembly is mounted with the impulse pin more remote from the balance wheel than the roller, thus increasing the clearance between balance wheel and escapement lever, over the more conventional arrangement.

3,791,252
FRETTED STRINGED INSTRUMENTS
Ralph R. Sibert, 1854 Buena Vista Dr., Euclid, Ohio, and Paul R. Misley, 17914 Brazil Rd., Cleveland, Ohio
Filed June 13, 1973, Ser. No. 369,522
Int. Cl. G10d 3/06
U.S. Cl. 84—314 6 Claims



A fretted stringed instrument wherein yieldably mounted frets are provided between rigid fret bars. This allows the strings to be stopped off with much less pressure than with conventional non-yieldable frets, and still produce a true tone.

3,791,253
CLARINET MOUTHPIECE WITH IMPROVED LIGATURE
Vito Pascucci, Kenosha, Wis., and William H. Stubbins, Ann Arbor, Mich., assignors to G. Leblanc Corporation, Kenosha, Wis.
Filed June 26, 1972, Ser. No. 266,384
Int. Cl. G10d 9/02
U.S. Cl. 84—383 7 Claims



A clarinet or the like ligature is provided with a slidably adjustable pressure bar. The outer end of the pressure bar is

turned under and exerts pressure against the reed along the longitudinal center line. The pressure point is adjustable from beneath the rim of the ligature to some distance down the reed, thereby affording individual control of the vibrational qualities of the reed, and hence of the tone characteristics.

3,791,254
TEACHING AID FOR DEMONSTRATING THE HARMONIC SYSTEM

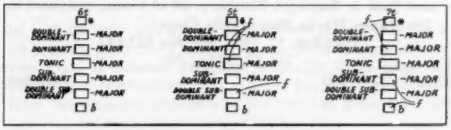
Egon Muller, 7, Hauptstrabe, D-7501, Grunwettersbach, Germany

Filed Nov. 1, 1971, Ser. No. 194,176

Claims priority, application Germany, Nov. 6, 1970, 2054561

Int. Cl. G09b *15/02*

U.S. Cl. 84—471 **8 Claims**



A teaching aid for demonstrating the harmonic system comprising two bar members arranged as in a slide rule, the lower member carrying the symbols and the upper member, which masks the lower member, a column of windows through which symbols from the lower bar member appear. By setting one window on a basic key note various harmonics may be read from the other windows.

3,791,255
METHOD OF FILLING BOREHOLES WITH VISCOUS SLURRIED EXPLOSIVES

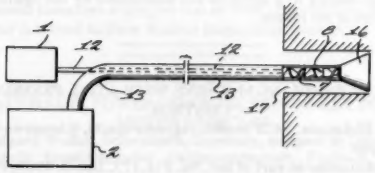
Richard Fox, Hawthorn; Darrell Andrew Williams, West Heidelberg, and Adam Prus Wisinski, Parkdale, Victoria, all of Australia, assignors to ICI Australia Limited, Victoria, Australia

Filed Jan. 10, 1972, Ser. No. 216,431

Claims priority, application Australia, Jan. 18, 1971, 3736/71

Int. Cl. C06b *19/00, 19/04*

U.S. Cl. 86—20 C **5 Claims**



A method of filling a void with a viscous product prepared by mixing two or more free flowing materials which method comprises firstly supplying separate streams of said free flowing material to the required position in a void and secondly mixing the separate streams at said required position to form the said viscous product in situ within said void. Apparatus used in the operation of the method is also described.

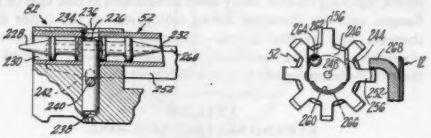
3,791,256
MACHINE GUN

George F. Curtis, East Longmeadow, and Henry J. Tatro, Jr., Westfield, both of Mass., assignors to Colt Industries Operating Corp., New York, N.Y.

Division of Ser. No. 857,479, Sept. 12, 1969, Pat. No. 3,688,641. This application Dec. 14, 1971, Ser. No. 207,938

Int. Cl. F41d *5/04*

U.S. Cl. 89—185 **10 Claims**



The machine gun of this invention features a unitary bolt and bolt drive assembly reciprocably mounted within a receiver along three longitudinally extending bearing supports symmetrically arranged in spaced relation to the receiver; the bolt and bolt drive assembly, together with a recoil buffer constituting an integral operating group removably maintained within the receiver by a single latch mechanism; a bolt carrier of the assembly incorporating actuating means for cartridge belt advance, cartridge extraction and ejection; the bolt carrier housing not only a rotary, front-locking bolt but also a cam follower which fixes a firing pin to the carrier and moves within a contoured slot in the bolt for locking and unlocking it in battery. This machine gun also features a gas recoil system for the bolt and bolt drive assembly having anti-fouling porting means for purging gas from the system under high pressure after firing; an ejector operated by the recoiling bolt and bolt drive assembly independently of its velocity; an automatically engageable, self-aligning barrel and receiver latch construction; and a sight assembly featuring a zero backlash precision screw adjustment means.

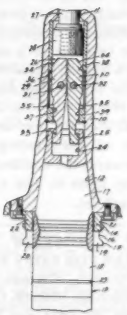
3,791,257
MACHINE TOOL TOOLING

James L. Frazier, Los Alamitos, and Richard Polacek, Palos Verdes Peninsula, both of Calif., assignors to Haudaille Industries, Inc., Buffalo, N.Y.

Filed Mar. 27, 1972, Ser. No. 238,198

Int. Cl. B23c *5/26*

U.S. Cl. 90—11 D **5 Claims**



A machine tool includes a rotatably driven axially movable spindle body having an axial opening terminating in a tool socket, a tool or tool adapter having a shank of corresponding configuration disposed in said tool socket, the shank having an axially opening clamping socket with overhanging shoulder

means partially closing the clamping socket, and axially driven clamping means reciprocable in the axial opening of the spindle, and extending into the sockets, the clamping means having a hook portion engageable with the shoulder means in an axial direction within said clamping socket. The tool or tool adapter of itself constitutes an article of commerce which includes a pair of axially spaced circumferential flanges with at least one axially extending slot therethrough, the flanges jointly defining a groove therebetween, the diameter of the shank tapering smaller away from the flanges at one side of the flanges and the diameter being cylindrical at the other side thereof. The axially driven clamping means includes two pivotable clamping members that are positively pivoted to their tool-clamping and tool-releasing positions.

3,791,258

STRAND MILLING MACHINE

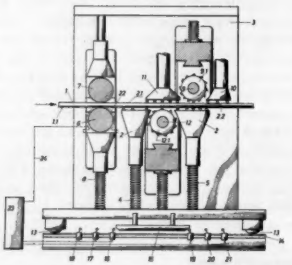
Heribert A. Krall, Wurzburg, and Helmut Maag, Hochberg, both of Germany, assignors to Technica - Guss GmbH, Wurzburg, Germany

Filed Jan. 16, 1973, Ser. No. 324,042

Claims priority, application Germany, Mar. 15, 1972, 2212344

Int. Cl. B23c *3/14*

U.S. Cl. 90—21 C **4 Claims**



A milling machine receives a strand or billet from a continuous casting machine. The machine has a frame and rollers that mount it for back and forth movement on rails in the line of the feed of the strand from the casting machine. A pair of pressure rollers, one above the other, feed the strand therebetween, one of the rollers being rotated by a motor. The milling machine has support tables adjustable vertically, over which the strand moves, rotating milling cutters above and below the strand for milling the same and pressure tables opposite the cutters so that the top and bottom of the strand are both milled. The two sets of electrical circuit limit switches along the rails. On the bottom portion frame of the movable milling machine is adjustable mounted a rail which contacts an actuating arm of the switches as it moves there over. These limit switches are in a control circuit to an electric motor that drives one of the feed rollers. The feed rolls draw the strand through the milling machine. If the circumferential speed of the feed rolls is faster than the medium strand speed from the drawing mechanism of the casting machine, the milling machine is moved towards the continuous casting plant. If it is lower, it moves away from it. The speed is graduated from switch to switch of each set.

3,791,259

STYLUS FOR COPY MILLING

Franz Rossberger, Munich, Germany, assignor to Friedrich Deckel Aktiengesellschaft, Munich, Germany

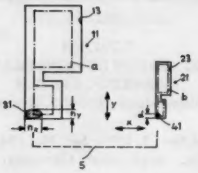
Filed Sept. 20, 1971, Ser. No. 181,764

Claims priority, application Germany, Sept. 25, 1970, 2047381

Int. Cl. B23c *1/16*

U.S. Cl. 90—62 R **10 Claims**

A stylus for use in copy milling at different transfer ratios in different axes. The apparatus aspects of the invention comprises a sensing stylus having an elliptical cross section and/or an elliptical tip in which the elliptical section is generated as a semi-rotational or half of an ellipsoid wherein the dimensions



of major and minor axes of such ellipse are derived as the product of the diameter of the tool multiplied by the inverse value of the transfer ratio in the respective axes of the tracing directions.

3,791,260

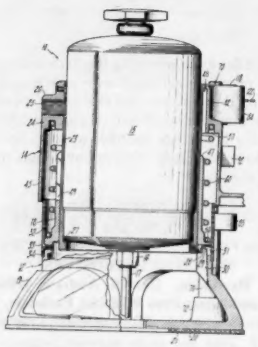
ROUTER

E. Curtis Ambler; Kestutis Damijonaitis, both of Newington, and Paul A. Ketchpel, Simsbury, all of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Feb. 17, 1972, Ser. No. 227,692

Int. Cl. B23c *1/20*

U.S. Cl. 90—12 D **5 Claims**



A portable electric router having a large diameter helical compression spring encircling a router bit drive motor and biasing the motor to a retracted position, and an adjustable stop and one-way locking device for presetting and locking the motor in an extended operating position and providing for plunge cutting to a depth of cut established by the operation position of the motor.

3,791,261

FLUID HANDLING MACHINE WITH AXIAL PRESSURE CONTROL

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 876,177, Dec. 2, 1969, Pat. No. 3,561,328, which is a continuation of Ser. No. 689,108, Dec. 8, 1967, abandoned. This application Nov. 16, 1970, Ser. No. 89,804

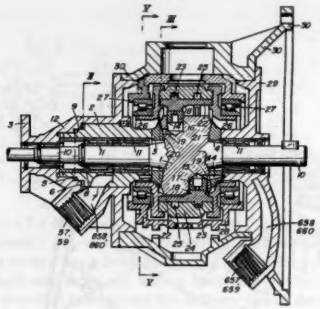
Claims priority, application Germany, Dec. 8, 1966, 902159

Int. Cl. F01b *1/00*

U.S. Cl. 91—485 **8 Claims**

In a fluid handling machine, such as a pump or motor, or a hydrostactic transmission, a presser body abuts at one end a rotor and forms at the other end outer and inner annular pres-

sure chambers with a housing part. The outer periphery of the outer pressure chamber and the inner periphery of the inner pressure chamber are coaxial with the rotor, but slidingly engaged cylindrical face portions along the inner periphery of the outer pressure chamber and outer periphery of the inner pressure chamber have a common axis eccentric to, and parallel with the rotor axis so that the widths of the effective annular pressure faces of the outer and inner pressure chambers varies. Fluid at different pressures is located in the inner and outer pressure chambers, and pressure forces are transmitted from the pressure chambers to the rotor to press the rotor against a staionary control face of the housing.



3,791,262

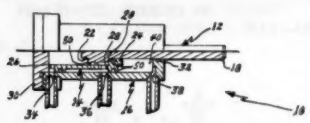
POSITIVE TRI-POSITION LINEAR ACTUATOR

John H. Staehlin, Baltimore, and William J. Meyer, Glen Burnie, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation of Ser. No. 59,960, July 31, 1970, abandoned. This application Jan. 4, 1972, Ser. No. 215,444

Int. Cl. F01b *7/20*

U.S. Cl. 92—52 **2 Claims**



A tri-position linear actuator having a pair of pistons slideably mounted within an outer housing. These two pistons are actuated by a pressure differential. By varying the differential pressures acting on one or both of the pistons the actuator is moved to three distinct longitudinal positions.

3,791,263

AUXILIARY POWER STEERING, ESPECIALLY FOR MOTOR VEHICLES

Wolfgang Walter, Schwabisch, Germany, assignor to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Postfach, Germany

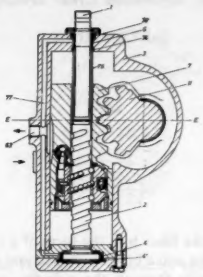
Filed Apr. 3, 1972, Ser. No. 240,732

Claims priority, application Germany, Apr. 8, 1971, 2117140

Int. Cl. F01b *31/18, 9/00*

U.S. Cl. 92—86 **1 Claim**

A hydraulically operated piston and cylinder arrangement for power steering is provided at the steering column end of the steering spindle with a radial bearing and high low pressure sealing gaskets. The other end is provided with radial and thrust bearings. Both bearing arrangements are connected through channels to the exhaust for the cylinder for relieving oil leakage. The arrangement permits construction of the combination of steering spindle, piston and cylinder which shortens the length of the spindle from the steering column end to the point opposite the gear segment of the steering arm operated by the piston.



3,791,264

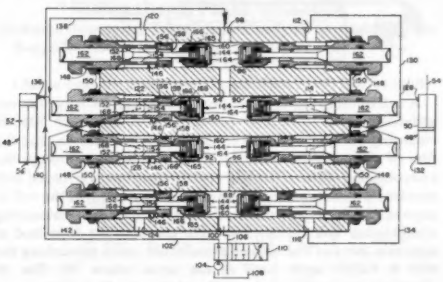
POWER TRANSMISSION DEVICE FOR ROTATING A GRADER CIRCLE

Paul Edmund Hanser, Moline, Ill., assignor to Deere & Company, Moline, Ill.

Continuation of Ser. No. 20,726, March 18, 1970, abandoned. This application Apr. 26, 1972, Ser. No. 247,661

Int. Cl. F01l *15/16;* **F01b** *15/04*

U.S. Cl. 91—176 **7 Claims**



A grader circle has an annular internal gear which is meshed with a gear carried at the bottom of a crank shaft. A pair of double-acting hydraulic actuators have their piston rods connected to the crank pin of the crank shaft and the circle is driven by alternate extensions and retractions of the piston rods. The cylinders of the actuators are swivelly connected to the circle-carrying frame by means of pin structures which are fixed to and swivel with the cylinders as the piston rods are extended and retracted. The pin structures terminate in cams which engage shiftable valve stems of a reversing valve to automatically reverse the flow of fluid to the actuators when the piston rods of the actuators reach the ends of their strokes.

3,791,265

APPARATUS FOR MAKING TOBACCO SMOKE FILTER

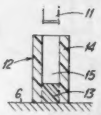
David Thomas Westcott, and Geoffrey Roger Woodman, both of Bristol, England, assignors to Imperical Tobacco Group Limited, London, England

Filed Jan. 14, 1972, Ser. No. 217,797

Claims priority, application Great Britain, Feb. 1, 1971, 3,550/71

Int. Cl. B31f *1/00*

U.S. Cl. 93—1 C 2 Claims



A tobacco smoke filter is in the form of a cylinder having a low resistance core and a high resistance end wall which cause smoke flow radially through the cylinder wall. The filter is preferably made by compacting the central core of a filter plug to form the dense end wall. Such filter plugs have an efficiency of two or three times that of a conventional filter of the same pressure drop.

3,791,266

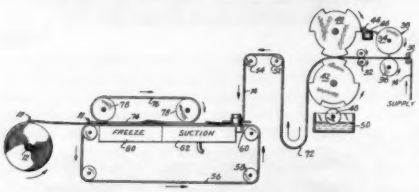
METHOD AND APPARATUS FOR MANUFACTURING TOILET PAPER ROLLS

Brian D. Bucalo, 155 Roberts St., Holbrook, N.Y.

Division of Ser. No. 198,551, Nov. 15, 1971, Pat. No. 3,734,277. This application Feb. 20, 1973, Ser. No. 334,087

Int. Cl. B31d *1/04*

U.S. Cl. 93—1 R 5 Claims



A roll of toilet paper which has web portions where the web is folded upon itself and provided with an inner film of cleansing composition and an outer barrier layer so that the film of cleansing composition cannot be spread through the convolutions of the roll while at the same time the folded web portions will become unfolded during unwinding of the roll to expose the cleansing composition. After the film of cleansing composition and barrier layer are respectively deposited at opposite faces of the web at preselected areas therealong the web is folded upon itself at the areas where the film of cleansing composition is located and then the film of cleansing composition at each folded web portion is frozen to retain each web portion in its folded condition during winding of the web into a roll.

3,791,267

METHOD AND APPARATUS FOR MAKING PACKAGES OF INTERCONNECTED PLASTIC BAGS AND THE LIKE

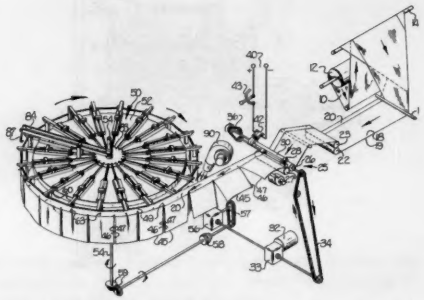
Thomas W. Brooks, Southern Pines, N.C., assignor to Aberdeen Bag Company, Aberdeen, N.C.

Filed Nov. 27, 1972, Ser. No. 309,740

Int. Cl. B31b *1/98, 23/74*

U.S. Cl. 93—35 R 18 Claims

A method and apparatus for making a plurality of packages of interconnected flexible plastic bags or the like and wherein an advancing web of thermoplastic sheet material is longitudinally folded to define upper and lower overlying sheets. The sheets are then fusibly joined and simultaneously severed along longitudinally spaced transverse lines while leaving a non-severed connecting portion to thereby form a series of connected bags each having a folded bottom edge, fusibly joined side edges, and an open top. The series of connected



bags is formed into a plurality of individual stacks of aligned overlying bags by circularly conveying the series about a central axis to form a plurality of overlying convolutions and with the bags of each convolution generally aligned with the bags of the adjacent convolutions. The bags of each stack may then be interconnected, and the connecting portion severed such that each stack forms a separate package of interconnected bags.

3,791,268

MACHINE FOR FLATTENING CARTONS

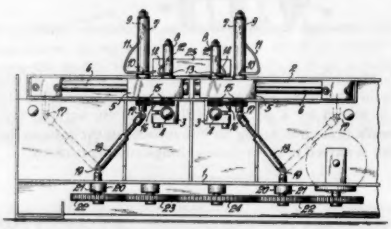
Ulrich Kollmar, Wurm/Pforzheim, Germany, assignor to Gebr. Bellmer KG Maschinenfabrik, Niefern/Baden, Germany

Filed Aug. 7, 1972, Ser. No. 278,502

Claims priority, application Germany, Aug. 5, 1971, 2139198

Int. Cl. B31b *1/52*

U.S. Cl. 93—53 R 12 Claims



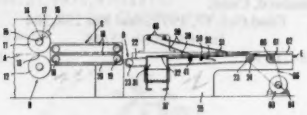
A machine for flattening cartons whereby the carton walls are erected about folding creases pre-embossed along their lower edges and whereby end sections provided on one set of mutually parallel walls are folded inwards at right angles about a vertical folding crease and their outsides can be glued to the insides of the walls which are parallel to them and whereby the ends of two mutually opposite walls are provided with folding creases extending from the lower corners of the carton to the upper edges of the walls under an angle of 45°. The machine is provided with folding devices arranged simultaneously to be moved against all four carton walls.

3,791,269

DEVICE FOR DELIVERING SHEETS

Tetsuya Sawada, Kyoto, Japan, assignor to Rengo Kabushiki Kaisha (Rengo Co., Ltd.), Osaka, Japan

Filed June 1, 1972, Ser. No. 258,784
Int. Cl. B65h *29/66*
U.S. Cl. 93—93 DP 1 Claim



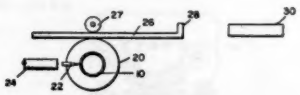
A device for forming a space between groups of a predetermined number of overlapped sheets moving successively in a line. The device has a first conveyor for conveying sheets of a fixed length which are cut from a band sheet. A second conveyor is provided just beyond the delivery end of the first conveyor for receiving sheets from the first conveyor in overlapping relationship. A suction means is provided adjacent said second conveyor for temporarily holding a sheet on the second conveyor by suction. The second conveyor is movable in such a way that the upper run thereof is movable up and down above and below the level of the suction means. The second conveyor is normally above the suction means, but when a predetermined number of sheets has been delivered to the second conveyor, the second conveyor is lowered, and one of the sheets delivered thereto is held by suction from the suction means to delay its movement along the second conveyor momentarily, after which the second conveyor is again raised to release the delayed sheet from the suction means.

3,791,270

PROCESS FOR ACCURATELY MARKING PRECISE RECTANGULAR AREAS

George R. Brewer, Malibu, and Russell R. Law, Pacific Palisades, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 23, 1968, Ser. No. 731,497
Int. Cl. B43l *13/02*
U.S. Cl. 95—1 1 Claim



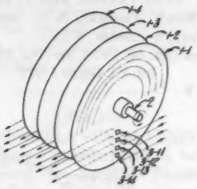
Precise rectangular areas are marked upon a photosensitive substrate by means of an accurate mask. The mask is produced by axially scribing an opaquely metalized quartz tube on its outer, circumferential surface with equally spaced scribe marks through the opaque metallization and circumferentially scribing the quartz tube with equally spaced circumferential marks through the opaque metallization. These two sets of scribed marks produce rectangular areas on the cylinder. The cylinder is rolled in contact with a photosensitive medium, with illumination being supplied from the inside of the quartz tube. Thus, the accurately scribed marks are transferred to the medium, and particularly to a fairly long medium which is not limited by the circumference of the quartz tube.

3,791,271

PHOTOGRAPHIC COMPOSITOR

Yukiyasu Nishikawa, Saitama, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Dec. 8, 1971, Ser. No. 205,816
Claims priority, application Japan, July 8, 1971, 46-50513
Int. Cl. B41b *15/06*
U.S. Cl. 95—4.5 4 Claims



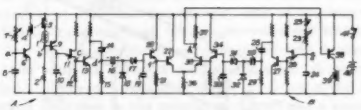
A photographic compositor character storage and optical retriever includes a plurality of axially spaced coaxially discs each having concentric circular groups of characters, as well as outer flash indexing marks and inner code symbols. Parallel flash beams are directed parallel to a face of each disc and are deflected at successive circular groups perpendicular to the disc and the beams transmitted through aligned characters are then deflected parallel to and along the opposite face of the disc. The sets of character beams from the discs are parallel and each group corresponding to a radially aligned set of characters from a respective disc is reflected by a corresponding first mirror to direct the beams along parallel lines colinear with the respective letter beams of the other discs and directed to respective second mirrors corresponding to longitudinally aligned disc characters which reflect the beams along colinear axes to an objective system. Selection of an individual character from the group in the X Y matrix effected by each flash and as reflected by the mirrors is accomplished by retracting or advancing corresponding one or more of the first and second mirrors.

3,791,272

AUTOMATIC CAMERA SHUTTER CONTROLS WITH STORAGE OR PULSE VOLTAGES

Tsukumo Nobusawa, Tokyo, Japan, assignor to Asaki Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Feb. 5, 1973, Ser. No. 329,854
Claims priority, application Japan, Feb. 7, 1972, 47-13418
Int. Cl. G03b *7/08*
U.S. Cl. 95—10 CT 18 Claims



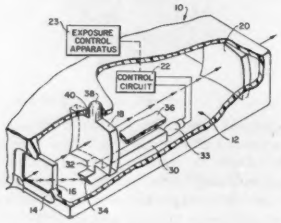
An electrical structure for automatically controlling a camera shutter. The structure includes a pair of memory capacitors for respectively storing voltages in response to pulses received by these memory capacitors, and oscillators are respectively connected electrically with the capacitors for transmitting the pulses thereto. One of the oscillators is operated in accordance with variable factors such as brightness at the object to be photographed, diaphragm setting, and film speed, while the other of the oscillators is operated according to a predetermined reference factor. The memory capacitor which stores a voltage in accordance with this reference factor has its operation started when the camera shutter opens and the voltage of this latter memory capacitor is compared with the voltage of the other memory capacitor.

When these voltages have a given relationship with respect to each other a signal is automatically transmitted to a structure which brings about closing of the shutter so as to terminate an exposure.

3,791,273
INDICATOR LIGHT FOR CAMERA HAVING ELECTRONIC SHUTTER

David Easton Beach, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 10, 1972, Ser. No. 296,390
Int. Cl. G03b *17/20*
U.S. Cl. 95—11 V **6 Claims**

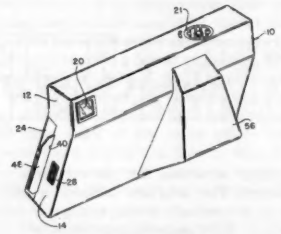


An indicator for use in a camera of the type having a light responsive electronic circuit which controls the open time of a shutter in relation to scene light intensity, and determines the existence of preselected camera states and/or scene light intensity conditions. The indicator includes a lens element having a portion which is external of the viewfinder, and a lamp connected to the electronic circuit. The indicator includes a light conducting element disposed relative to the lamp and to the lens element so that light from the lamp is transmitted to a location to be observed through a viewfinder of the camera, and to the lens element which transmits the light to the external portion, so that the light transmitted from the lamp to the external portion may be observed at a position removed from the camera viewfinder.

3,791,274
ANATOMICAL CAMERA DESIGN

David E. Hansen, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 5, 1972, Ser. No. 268,934
Int. Cl. G03b *17/02*
U.S. Cl. 95—11 R **8 Claims**

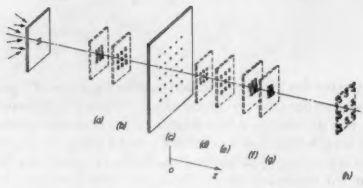


A camera employs two mirrors for establishing a folded optical path along which light rays are reflected from a forwardly facing lens to a rearwardly facing photosensitive film surface. The photosensitive film surface, and a gripping portion of a box-like housing containing the film, are oriented below and at an angle to the lens axis such that the light rays are reflected downwardly and forwardly through more than 180° before impinging at right angles on the film surface. This arrangement affords improved camera compactness and facilitates comfortable and steady manipulation of the camera during picture-taking operations by locating the camera gripping surfaces at a natural or comfortable angle for the photographer's hands and wrists.

3,791,275
MULTIPLE IMAGE FORMATION THROUGH SELF-IMAGING

Olof Bryngdahl, Cupertino, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 17, 1972, Ser. No. 298,204
Int. Cl. G03b *35/08*
U.S. Cl. 95—18 R **12 Claims**

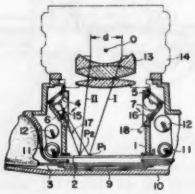


The present invention relates to the formation of multiple images by self-imaging. Individual points of an incoherently illuminated object serve as sources to achieve self-images of a pinhole array. By using an incoherent, monochromatic light source to illuminate a single object, a plurality of pinholes in a periodic structure allows for the production of sharpened images at defined locations from the structure. At certain defined locations, Fresnel images are formed which are true images of the object numbering higher than said plurality of pinholes.

3,791,276
LIGHT MEASURING APPARATUS FOR CAMERA SHUTTER CONTROL MECHANISMS

Hiroshi Ueda, Nara, and Takeshi Egawa, Kainan, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka-fu, Japan

Filed June 4, 1971, Ser. No. 149,939
Int. Cl. G03b *19/12*
U.S. Cl. 95—42 **5 Claims**



In a single lens reflex camera having a focal plane shutter with a light reflecting surface, the light receptive elements are mounted outside of the direct light path from the objective lens to the film so as to receive light reflected from both the film and the light reflecting surface of the focal plane shutter. Structure is mounted to block selected light rays reflected from the film and/or the light reflecting surface of the focal plane shutter.

3,791,277

SWITCHING APPARATUS FOR ELECTRIC SHUTTER MECHANISMS

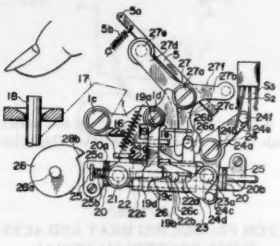
Toshio Kobori, and Masaru Ohba, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka-shi, Osaka-fu, Japan

Continuation-in-part of Ser. No. 165,562, July 23, 1971, abandoned. This application Mar. 8, 1973, Ser. No. 339,282

Claims priority, application Japan, July 25, 1970, 45-65336; Nov. 27, 1972, 47-118107

Int. Cl. G03b 19/12

U.S. Cl. 95—42 12 Claims



An electric shutter switching mechanism includes a first switch for selectively connecting a storage element with a light measuring circuit and a second switch for selectively connecting a timing circuit for closing the shutter with an electric power source. An operating member is movable between first and second positions which respectively represent the viewing condition and the photographing condition of the camera. The member interlocking with the operating member actuates the first switch to electrically isolate the storage element from the light measuring circuit and actuates the second switch to connect the timing circuit to the electric power source. With the operating member in the second position the interconnection between the members and the shutter releasing operation is terminated.

3,791,278

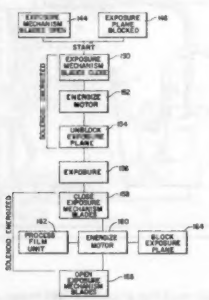
PHOTOGRAPHIC APPARATUS WITH SOLENOID POWERED INSTRUMENTALITIES

Conrad H. Biber, Needham, and Edwin K. Shenk, Littleton, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed July 19, 1971, Ser. No. 163,948

Int. Cl. G03b 9/62

U.S. Cl. 95—53 EA 18 Claims



Photographic apparatus incorporating a solenoid driven shutter and self-contained battery power supply. To conserve energy available from the battery, a power-down feature is selectively activated during those portions of an automatic photographic cycle requiring a closed shutter condition. The power-down feature particularly incorporates a dual circuit path configuration leading directly from the battery power supply to the excitation winding of the solenoid. At the commencement of energization of the solenoid, full available current is imposed through both circuit paths until such time as the plunger of the solenoid reaches a high flux linkage condition. As this condition is reached, one circuit path is rapidly switched off to permit energization of the solenoid winding to continue through the opposite circuit path at a selectively lower current level. A signaling arrangement is utilized to initiate the noted switching.

3,791,279

DAMPER UNIT FOR A VENTILATION SYSTEM

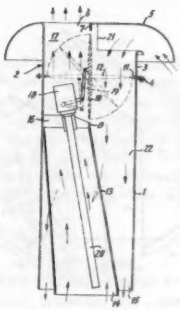
Jorgen Holt, and Hans Christian Hansen, both of Naestved, Denmark, assignors to Nordisk Ventilator Co. A/S, Naestved, Denmark

Filed July 5, 1972, Ser. No. 268,955

Claims priority, application Denmark, July 6, 1971, 3323/71; Sept. 6, 1971, 4371/71

Int. Cl. F24f 7/06

U.S. Cl. 98—33 A 8 Claims



A damper unit for ventilating systems and comprising a housing having two internal ducts or passages for fresh air and return air, respectively, and an internal by-pass between the ducts. The ducts are parallel at the outer end of the housing and concentric at the inner end thereof. One of the internal ducts is defined by an inclined, tubular partition wall which at its outer end merges with the housing wall and with a central partition between the parallel outer duct ends. A pivotal damper has a first end position in which it obturates the by-pass which is provided in the central partition, and a second end position in which it obturates the outer ends of both ducts and opens the by-pass to provide full recirculation of spent room air. In intermediate positions the damper provides for partial recirculation.

3,791,280

SCREENED VENTILATOR

John R. Williamson, 818 E. 39th St., Hibbing, Minn.

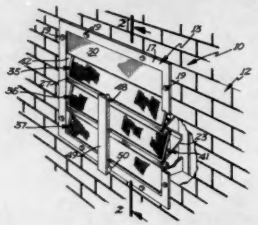
Filed Sept. 14, 1972, Ser. No. 289,153

Int. Cl. F24f 7/02

U.S. Cl. 98—40 VM 6 Claims

A ventilator for a building having a plurality of inclined louver blades and a plurality of longitudinally pivoted screen sections normally biased into engagement with portions of the adjacent louver sections to form a screen. If the screens

become temporarily clogged as with ice or frost, the differential air pressure on opposite sides of the screen sections



causes them to swing open against their bias to enable passage of air through the ventilator.

3,791,281

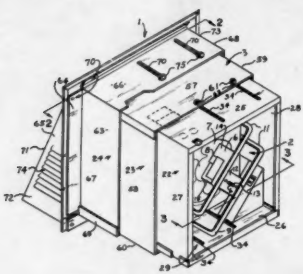
EXHAUST FAN ASSEMBLY

Robert E. Steiner, St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Feb. 17, 1972, Ser. No. 227,031

Int. Cl. F24f *7/00*

U.S. Cl. 98—43 **11 Claims**



An improved exhaust fan assembly is provided in which a fan and damper are mounted in a frame, the damper being mounted at the fan outlet, within an exhaust fan housing structure. Two springs are utilized to hold the damper closed. The damper opens by the force of air exerted during fan operation. During that operation, the springs exert a force which helps to hold the damper open. At least one spring has a top extension that contacts a pin on the damper, keeping the over-center force from becoming so great to hold the damper open permanently. The fan and damper are self-contained with respect to the rest of the fan housing and the length of the exhaust fan housing can be varied for differing thicknesses of wall through which the housing is to extend.

3,791,282

WEATHER CAP FOR EXHAUST PIPE

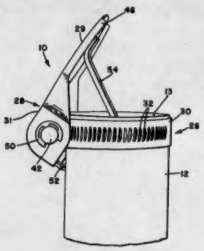
Herman William McElhose, and William Robert Salow, both of Waterloo, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Nov. 10, 1972, Ser. No. 305,476

Int. Cl. F23l *17/02*

U.S. Cl. 98—59 **6 Claims**

A weather cap for an upstanding exhaust pipe includes a cover flap which, in the absence of gas pressure within the exhaust pipe, covers the exhaust port and, in the presence of gas pressure, pivots upwardly to permit escapage of the gas. The cover flap is pivotally secured to the exhaust pipe by a flexible band of variable diameter surrounding the outer wall of the exhaust pipe and held in pressure engagement therewith by a worm carried on one end of the band which worm meshes with aligned slots on the opposite end of the band. Since the diameter of the band is variable, the weather cap has universal application and one weather cap is adaptable to various size ex-



haust pipes. A counterweight carried on the underside of the cover flap aids in the closing of the cover flap when gas pressure ceases.

3,791,283

METHOD FOR PRODUCING HEAT AND ACID STABLE WHEY PROTEIN MATERIAL

Victor Moreno, White Plains, and David A. Lysak, Pearl River, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Aug. 28, 1970, Ser. No. 68,026

Int. Cl. A23c *21/00*

U.S. Cl. 99—57 **8 Claims**

Heat and acid stable whey protein material is produced having on a weight basis ratios of calcium to protein from .002 to .05, ash to protein from .02 to 0.2 and calcium to ash from .02 to .35. This protein material is derived from liquid whey by means of adjusting the calcium content of liquid whey and then isolating the protein material by means of physical separation techniques.

3,791,284

MACHINE FOR MAKING COFFEE BEVERAGE

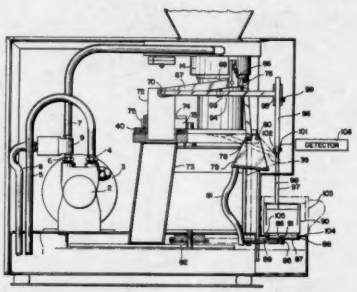
Guy R. Donot, 11, rue Richepanse, Paris, France

Filed Jan. 26, 1972, Ser. No. 220,832

Claims priority, application France, Jan. 29, 1971, 71.03068; June 14, 1971, 71.21546; Aug. 10, 1971, 71.29212

Int. Cl. A47j *31/00*

U.S. Cl. 99—289 **9 Claims**



Machine for making a coffee beverage and dispensing the same into cups. The machine has a single water circuit in a part of which the water is cold and in the other part of which it is hot. The pressure-fed cold water actuates a jack, the mobile armature of which is formed by a boiler completely filled up with hot water. The water actuating the jack first shifts the

boiler and then enters the boiler, causing the ejection of an equal amount of hot water. The hot water passes through ground coffee contained in a filtering chamber bounded by the boiler bottom and a duct provided in a swivelling platform.

3,791,285

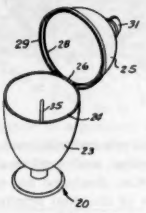
APPARATUS FOR MOLDING AND COOKING EGG PRODUCTS

Leeqett Mack, 641 49th St. N.E., Washington, D.C.

Continuation of Ser. No. 19,350, March 13, 1970, abandoned. This application June 23, 1972, Ser. No. 265,581

Int. Cl. A23p *1/00;* **A47j** *43/18, 43/20*

U.S. Cl. 99—419 **4 Claims**



An egg product is formed by separating the raw egg white from the yoke and hard-boiling the white around a meat or other food center to produce an egg product which resembles a hard-boiled egg having the substitute yoke consisting of any desired food material. The apparatus includes a cup having a spike to support the substitute yoke and an opening at the top to permit the white of the egg to be poured therein, to surround the substitute yoke. The cup has the shape of an egg and when heated in a water bath produces the desired egg product.

ERRATUM

For Class 99—2 R see:
Patent No. 3,791,241

3,791,286

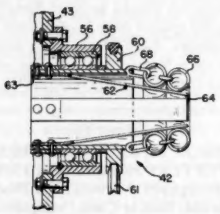
METHOD FOR COMPACTING FIBROUS MATERIAL

Joseph Molitorisz, Bellevue, Wash., assignor to Rotopak Systems, Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 121,704, March 8, 1971. This application Feb. 25, 1972, Ser. No. 229,532. The portion of the term of this patent subsequent to Sept. 19, 1989, has been disclaimed.

Int. Cl. B30b *3/04*

U.S. Cl. 100—40 **6 Claims**



A compressed core of fibrous material is rolled in a single channel defined by a plurality of circumferentially spaced skewed rollers which impart to the core radial, tangential and axial forces. The uncompacted fibrous material fed to the channel is limited to a width less than the length of the channel. The remainder of the channel is a finishing zone. Discharge of the compressed core from the finishing zone is controlled by a density controlling valve. The discharged core is cut into wafers.

3,791,287

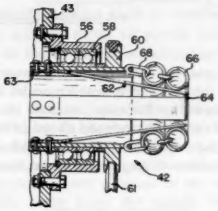
APPARATUS FOR COMPACTING FIBROUS MATERIAL

Joseph Molitorisz, Bellevue, Wash., assignor to Rotopak Systems, Inc., Bellevue, Wash.

Continuation-in-part of Ser. No. 121,704, March 8, 1971. This application Feb. 25, 1972, Ser. No. 229,533. The portion of the term of this patent subsequent to Sept. 19, 1989, has been disclaimed.

Int. Cl. B30b *3/04*

U.S. Cl. 100—89 **19 Claims**



A compressed core of fibrous material is rolled in a single channel defined by a plurality of circumferentially spaced skewed rollers which impart to the core radial, tangential and axial forces. The uncompacted fibrous material fed to the channel is limited to a width less than the length of the channel. The remainder of the channel is a finishing zone. Discharge of the compressed core from the finishing zone is controlled by a density controlling valve. The discharged core is cut into wafers.

3,791,288

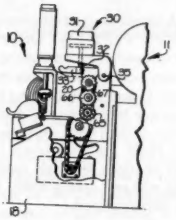
TEXTILE WEB CALENDERING APPARATUS

Marcus G. Whitehurst, Gastonia, N.C., assignor to Piedmont Machine Shop, Inc., Gastonia, N.C.

Filed Dec. 22, 1971, Ser. No. 210,714

Int. Cl. D01b *1/36;* **B30b** *3/04*

U.S. Cl. 100—170 **8 Claims**



A plurality of calender rolls in a textile web calendering apparatus extend transversely between first and second spaced apart side frame members and are supported by antifriction bearings disposed in elongate slots in the side frame members. By means of a particular mounting arrangement, the side frame members cooperate in maintaining the antifriction bearings and the rolls in assembled relation and in restraining the rolls against movement transversely of the side frame members.

3,791,289

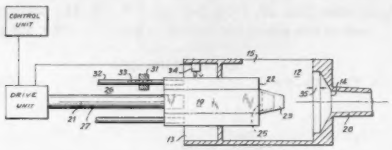
APPARATUS FOR COMPACTING MATERIAL

Howard W. Lamorte, and Kostas Pliakos, both of Bronx, N.Y., assignors to Hico Corporation of America, Bronx, N.Y.

Continuation-in-part of Ser. No. 818,332, April 22, 1969, abandoned. This application Mar. 3, 1971, Ser. No. 120,609

Int. Cl. B30b *15/18*

U.S. Cl. 100—179 **11 Claims**



The ram of apparatus for compacting material has a head surface movable into proximity with an outlet duct of a receptacle for the material and a nose coaxially positioned on the head surface and extending forward ahead of the head surface for passing into the outlet duct. An adjustable switch controls the driving movement of the ram and thereby varies the compaction ratio.

3,791,290

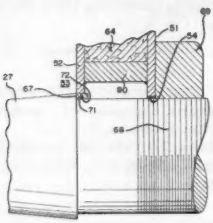
HIGH SPEED, HIGH TEMPERATURE EMBOSSING MACHINE AND WHEEL THEREFOR

Gary C. Colledge, 13900 Marquesas Way, Marina Del Rey, Calif.

Division of Ser. No. 216,061, Jan. 7, 1972, Pat. No. 3,730,081. This application Feb. 14, 1973, Ser. No. 332,298

Int. Cl. B41b *2/08*

U.S. Cl. 101—31 **5 Claims**



A high speed, high temperature embossing machine for embossing wood products and a high temperature embossing wheel therefor is disclosed. The embossing wheel is electrically heated by elements carried at the rim thereof to temperatures as high as 1,400° F.,and an embossing feed rate as high as 200 feet per minute may be employed. A large diameter hollow wheel filled with a thermally insulating material and a tapered, elongated shaft are employed to minimize heat transfer to the shaft bearings for high speed operation. Embossing wheel tilting and embossing wheel raising and lowering mechanisms are also disclosed.

3,791,291

DUAL PRINTING APPARATUS WITH SELECTIVE HAMMER ARMING MEANS

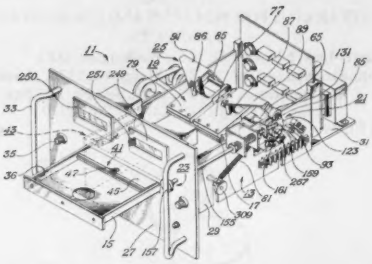
Charles W. Macune, and Walter J. Parrish, both of Fort Worth, Tex., assignors to Kodata, Inc., Ft. Worth, Tex.

Filed Feb. 26, 1973, Ser. No. 336,040

Int. Cl. B41j *45/00;* **G01d** *9/00*

U.S. Cl. 101—69 **22 Claims**

Apparatus for effecting two printing operations on a delivery ticket characterized by a dual printing mechanism having a ticket drawer into which the ticket is emplaced, the drawer being pushed inwardly into a plurality of positions. The inward movement of the drawer arms spring loaded print mechanism, including two print hammers, to deliver a striking force against the ticket to effect a printing from delivery data



print wheels. The data print wheels contain product identification, transaction number, and number of units of quantity of product delivered. Also disclosed are specific embodiments enabling remote use of the dual printing mechanism, safety switches and specific structural features.

3,791,292

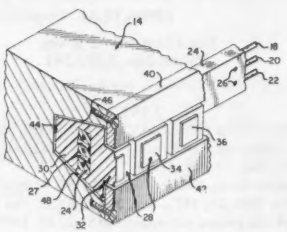
TYPE BELT FOR A BELT PRINTER

Melvin A. Soderstrom, and John W. Thomas, both of Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Continuation of Ser. No. 40,688, May 26, 1970, abandoned. This application Feb. 22, 1972, Ser. No. 228,415

Int. Cl. B41j *5/08*

U.S. Cl. 101—111 **1 Claim**



A low-cost type belt for a belt printer which includes non-extensible tensile members formed into a continuous loop and elastomeric character blocks secured thereto. The character blocks are equally spaced from one another and encapsulate the tensile members. Each block has a printing portion on which a character is formed and a driving portion enabling it to be driven by a complementary drive pulley.

3,791,293

PRINTING SELECTIVELY ON LETTERS OR ON TAPE WITH FLAT BED PRINTING MEANS

Andrew W. Rastorguyeff, Norwalk, and Frederick W. Uthenwoldt, Glenbrook, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

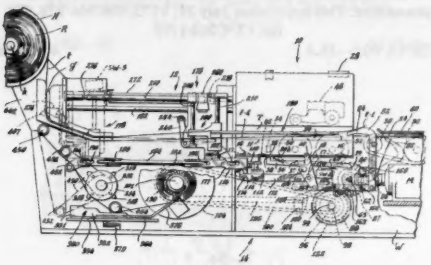
Filed Mar. 18, 1971, Ser. No. 125,686

Int. Cl. B41f *13/24, 1/08*

U.S. Cl. 101—234 **18 Claims**

A machine for printing selectively on letters or on lengths of tape of the pressure sensitive adhesive type is provided by combining with a postage meter having flat bed printing means, tape supply and control means and a tape carrier

which is projectible into the throat of the postage meter to the printing station therein, and means responsive to the position of the tape carrier to condition the machine for ejecting printed letters or for advancing the printed end of a tape strip



a predetermined distance to a position where it can be torn off, including means for taking up slack in the tape when the carrier is retracted in shifting from tape mode to letter mode operation.

3,791,294

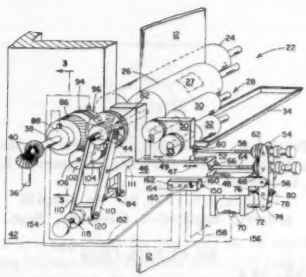
PRINTING PRESS

Geoffrey Harry Skelding, Old Swinford, England, and Wilbur G. Tracey, Beverly Farms, Mass., assignors to Gloucester Engineering Co., Inc., Gloucester, Mass.

Filed Jan. 17, 1972, Ser. No. 218,346

Int. Cl. B41f *13/24, 5/16;* **F16h** *3/10*

U.S. Cl. 101—248 **4 Claims**



Printing press improvements useful in flexographic printing. A register control device comprises first and second freely rotatable gears, separate clutches alternatively securing one or other of the gears to a drive and a bridging shaft having gears meshed with both free gears. With clutch associated with first free gear engaged, drive train from first gear to driven roll results; alternatively with that clutch disengaged and other engaged, drive train from second free gear, through bridge shaft to first free gear to driven roll results. One gear train produces 1 to 1 surface speed ratio between plate and impression rolls, the other produces a register correction speed, off e.g. by 0.5 percent. Also shown are drive shaft directly driving the impression roll with free gears coaxial and free thereon; first free gear directly driving plate roll; and both clutches disengaged for stoppage. A register control system using two alternate drive trains, with speeds as above, includes normally engaging clutch in the 1 to 1 gear train and means for disengaging that clutch and engaging a clutch in the other gear train for a short duration, and then back to the original gear train. Shown are automatic means, preferably a timer, for controlling this cycle. A roll separation system includes a lever with inking slide assembly connected to a point further from lever pivot than plate roll, and looped chain drive driving the rolls irrespective of position of the lever.

3,791,295

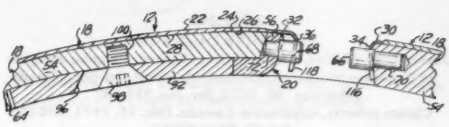
SELF-TENSIONING PRINTING PLATE SADDLE

William H. Albright, 305 Ivanhoe Blvd., Orlando, Fla.

Filed Sept. 11, 1972, Ser. No. 287,965

Int. Cl. B41f *27/06*

U.S. Cl. 101—415.1 **4 Claims**



A semi-cylindrical adapter shell or "saddle," around which is bent a thin arcuate metal or plastic printing plate, and bolted in pairs to the cylinders of newspaper printing presses to replace the now obsolescent stereotypes, has transversely spaced pins on its opposite ends projecting through holes in the inwardly bent ends or flaps of the printing plate. The pins on the leading end are fixed whereas those on the trailing end are movable by being mounted on a transverse spring-loaded foot bar carried by arcuate guide arms slidable circumferentially in arcuate guide grooves in the saddle and urged circumferentially away from the saddle by springs which tightly stretch the printing plate circumferentially around the saddle in snugly fitting surface-to-surface engagement from end to end of the printing plate. A rotary cam tool insertable in a radial hole in the cylinder in the gap between the adjacent ends of a pair of saddles mounted on the cylinder enables the foot bar to be temporarily retracted during mounting of the printing plate on the saddle.

3,791,296

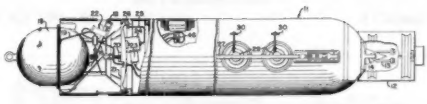
ICE DEMOLITION CHARGE

Charles C. Vogt, Bethesda; John W. Talcott, Decatur Heights; Donald M. Leslie, Silver Spring; Clark W. Dovell, Silver Spring, and Samuel J. Black, Silver Spring, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 27, 1960, Ser. No. 45,768

Int. Cl. F42b *22/00*

U.S. Cl. 102—10 **3 Claims**



1. A surface seeking underwater demolition device capable of being ejected from a torpedo tube for blasting a passageway in an ice pack to allow an underwater craft to surface comprising a casing, a float removably attached to one end of said casing, said float causing the device to be buoyant so that it will rise to the underside of the ice pack, guide fins removably attached to the other end of said casing, a copious quantity of explosives located in said casing, a hydrostatically actuated switch in said casing, delay means actuated by said hydrostatic switch for delaying operation of said device a short period of time, a source of electrical power connected to one side of said delay means, an electro-responsive squib connected between the other side of said delay means and said source of electrical power, a releasing pistol located on said casing with said squib mounted therein, a connecting cable normally holding said float to said casing and passing through said releasing pistol, a cutter located in said releasing pistol for cutting said connecting cable when operated by said squib to release said

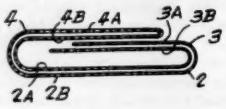
float, a standoff cable attached to said casing and said float for suspending said casing at a depth of several feet below said float, an electrical switch, pressure sensitive means for determining when the casing has been suspended below said float and for closing said electrical switch, and detonating means connected to said source of electrical power by said electrical switch for detonating the quantity of explosives.

3,791,297

EXPLOSIVE PACKAGE

James Glen McKee, Chateauguay, Quebec, Canada, assignor to Canadian Industries, Limited, Montreal, Quebec, Canada

Filed Nov. 30, 1972, Ser. No. 310,887
Claims priority, application Canada, Dec. 15, 1971, 130230
Int. Cl. F42b *3/00*
U.S. Cl. 102—24 R 5 Claims



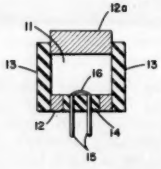
A thermoplastic film package containing a blasting explosive is provided having particular utility in secondary blasting operations. The package is especially suitable for aqueous slurry blasting agents which are filled through a self-closing valved opening. The package is also provided in the form of a train of detachably connected side-by-side packages.

3,791,298

ELECTRICAL SWITCHING DEVICE EMPLOYING A VAPORIZABLE CONDUCTIVE ELEMENT

Philippe Paul Roger Armand Amberny, Bourges, France, assignor to Etat Francais, Paris, France

Filed Jan. 18, 1972, Ser. No. 218,847
Claims priority, application France, Jan. 18, 1971, 71.01517
Int. Cl. F42b *3/12*; H01h *37/76*
U.S. Cl. 102—28 EB 8 Claims



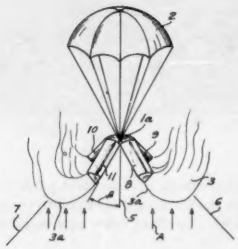
An electrical switching device for causing a relatively large current to flow in response to a low voltage impulse comprising a cavity formed of two spaced electrodes surrounded by an insulating cylindrical member. At least one conductive element is located within the cavity and provided with leads extending through a removable insulating plug mounted within one of the electrodes. When a low voltage impulse is applied across the leads, the conductive element is vaporized forming an ionized gas within the cavity thereby permitting the flow of current between the electrodes.

3,791,299

DEVISIBLE PYROTECHNIC DEVICE

Bjorn Herman Olof Simmons, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Continuation-in-part of Ser. No. 93,995, Dec. 1, 1970, abandoned. This application July 31, 1972, Ser. No. 276,901
Int. Cl. C06d *1/10*
U.S. Cl. 102—35.4 4 Claims



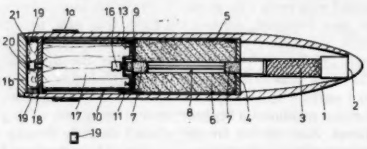
An illuminating body which is attachable to a parachute is divided into a number of partial flares which slant outward from the axis of the body at given angles by virtue of the fact that an elongated body of pyrotechnic material is divided into a number of axial sections which fan out from a common connection at one end.

3,791,300

FLARE SHELL

Jurgen Prochnow, Dusseldorf, and Walter Simon, Laurenberg/Aachen, both of Germany, assignors to Rheinmetall GmbH, Dusseldorf, Germany

Filed Sept. 5, 1972, Ser. No. 286,420
Claims priority, application Germany, Sept. 4, 1971, 2144400
Int. Cl. F42b *13/38*
U.S. Cl. 102—35.6 5 Claims

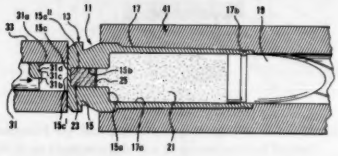


The invention concerns a flare shell, from the base of the case of which an internal appliance, consisting of a drogue parachute, a main parachute and a flare set, is ejected by means of an ejection charge which detonates the flare set, the internal appliance first being brought to a low speed of flight by the drogue parachute, whereupon the main parachute unfolds and floats to earth with the flare set.

3,791,301
INTEGRAL PRIMER CARTRIDGE

Nicholas J. La Costa, Phoenix, Md., assignor to AAI Corporation, Cockeysville, Md.

Continuation of Ser. No. 103,237, Dec. 31, 1970, abandoned.
This application Feb. 20, 1973, Ser. No. 333,700
Int. Cl. F42b *5/28*
U.S. Cl. 102—45 **12 Claims**

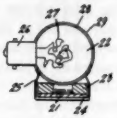


A cartridge having a case with an anvil-less percussive ignition primer as an integral unitary part of the cartridge case, the case having a cup-shaped bore into which is compacted a primer mixture without an anvil.

3,791,302
METHOD AND APPARATUS FOR INDIRECT ELECTRICAL IGNITION OF COMBUSTIBLE POWDERS

Ian C. McLeod, 1950 Penobscot Dr., Okemos, Mich.

Filed Nov. 10, 1972, Ser. No. 305,374
Int. Cl. F42c *19/08;* **F23q** *7/00;* **F21k** *5/02*
U.S. Cl. 102—70.2 A **14 Claims**



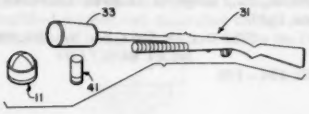
A method and apparatus for the ignition of combustible powders using transparently shielded sources of high intensity light pulses is described. Preferably, low actuating voltage, one shot or consumable photoflash lamps are used to generate a light pulse which is absorbed by the combustible powders and produces ignition. Particularly described is a flashbulb connected to a flashing circuit and a secondary circuit in the flashing circuit for intermittently or continuously conductively monitoring the firing status of the bulb prior to flashing. Particularly preferred combustible powders are nitrocellulose and/or black powders which because of their black color are particularly light absorptive. A photoflash igniter device for practicing the method is particularly described. The igniter and method are particularly useful for generating gas pressure waves which can be used for mass movement and/or forming.

3,791,303
DETERRENT AMMUNITION

Patrick E. Sweeney, Baltimore, and Robert W. Schneppe, Jr., Upperco, both of Md., assignors to AAI Corporation, Cockeysville, Md.

Filed Feb. 22, 1973, Ser. No. 334,808
Int. Cl. F42b *11/18, 11/36*
U.S. Cl. 102—92.7 **26 Claims**

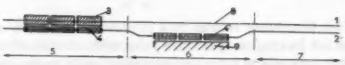
Deterrent ammunition, including a liquid-filled hollow ball of easily flexible plastic material, which is scored to form orange-peel-like rupture sections on impact with a target. The ball is releasably secured in cradled relation for launching in a dual element sabot, including a cradle unit of low-density foam plastic with a rigid disc sabot backing element.



3,791,304
CONTINUOUS TRANSPORTATION INSTALLATION

Gerard Bardet, Paris; Jean Gayot, Meudon, and Vincent Bouee, Boulogne, all of France, assignors to Engins Matra, Paris, France

Filed Oct. 12, 1970, Ser. No. 79,759
Int. Cl. B61k *1/00*
U.S. Cl. 104—18 **14 Claims**



A continuous passenger transportation installation comprising conveyor trains circulating continuously, but not at uniform speed, and loader trains bringing passengers from platforms to the conveyors or from the conveyor trains to platforms.

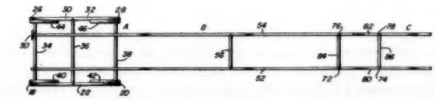
Each conveyor is connected to a loader on at least one part of the journey between two stations to allow transfer of passengers between the two trains.

This installation also comprises driving means on board, and controls to ensure connection and separation of the two trains.

3,791,305
ROLLER COASTER

Edward M. Matelan, 3205 Eisenhower Dr., McKeesport, Pa.

Filed Dec. 29, 1971, Ser. No. 213,672
Int. Cl. A63g *21/04*
U.S. Cl. 104—69 **5 Claims**

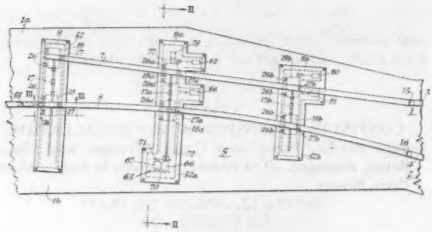


An amusement device comprises a lightweight coaster adapted to move by gravitation along a track configuration having portions of varying inclination. The track is supported at its elevated end by an assembly which also serves as a mounting platform, and at a point intermediate its ends by another support structure. Spaced apart, substantially convex parallel rails, on which coaster wheels having a substantially concave circumferential groove therein are adapted to ride, form the track. The coaster is generally box-shaped, substantially enclosed at the top, and houses a compartment in which the occupant sits and which includes a handle-bar assembly and a coaster release handle to initiate coaster motion. The wheels of the coaster are adjustable to control their speed of rotation.

3,791,306
VEHICLE GUIDEWAY SWITCHING MECHANISM

Joseph F. Wagner, North Cape May, N.J., and Peter M. Noble, Valencia, Pa., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Filed Oct. 18, 1971, Ser. No. 189,888
Int. Cl. B61b *13/04*
U.S. Cl. 104—130 5 Claims

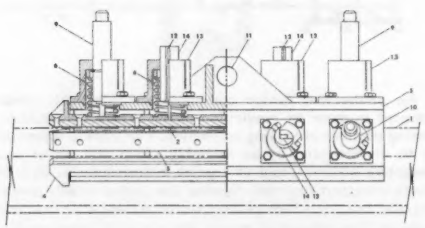


This disclosure relates to a guideway switch for self-guided vehicles having at least two selectable routes of travel. The switch includes at least two movable guide beams each having one end pivotally connected with the stationary guide rails of a roadway having a horizontal supporting surface on each side of the guide rails. A plurality of wheeled carriers are disposed below the horizontal supporting surfaces and are guided by a trackway. Each wheeled carrier includes a vertically adjustable support which has one end rigidly connected to the movable guide beams and which has the other end rotatably and slidably connected to the wheeled carrier. An actuating means includes an electric motor which drives a ball bearing screw drive mechanism. The screw drive mechanism moves the wheeled carriers and, in turn, shifts the movable beams to selected positions to establish the desired route of travel over the roadway for the self-guided vehicles.

3,791,307
RAIL CAR SLIPPER

Lindsay M. Applegate, Paradise, Calif., assignor to Cushion Rail International, Inc., Roseville, Calif.

Filed Apr. 3, 1972, Ser. No. 240,744
Int. Cl. A63g *21/00*
U.S. Cl. 104—134 2 Claims

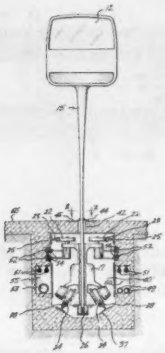


An assemblage of frame, sliding shoes, control springs and control elements for bearing the weight of a car sliding on rails and for guiding and stabilizing the car on the rails.

3,791,308
MASS TRANSIT SYSTEM

Billy J. Hartz, 4016 N. E. 110th, Seattle, Wash.

Continuation of Ser. No. 77,060, Oct. 1, 1970, abandoned.
This application Mar. 23, 1973, Ser. No. 344,092
Int. Cl. B61d *5/00*; B60v *1/00*
U.S. Cl. 104—139 17 Claims



A mass transit system compatible with existing right-of-way usages is described. A self-propelled carriage mechanism supports the passenger compartment in both the vertical and horizontal planes by means of a vertical strut, with the passenger compartment positioned substantially above the running gear. The running gear travels within an entrenched passageway having a narrow slit at the top of the strut connecting the passenger compartment and the running gear. The top surface of this passageway is suitable for use by surface traffic and a flexible closure member may be utilized to close the slit prior to and subsequent to passage of the mass transit vehicle. The passenger compartment is positioned far enough above the running gear so as to clear surface traffic and to avoid collision of the passenger compartment with other vehicles occupying the right-of-way. The entrenched passageway in which the running gear operates may be positioned in the center of a roadway between the lanes of traffic, at the edge thereof or in other right-of-way locations, as desired. Switching mechanisms are provided so that the invention may be used in feeder and trunk line-type applications as well as loop-type and car reversal methods of use.

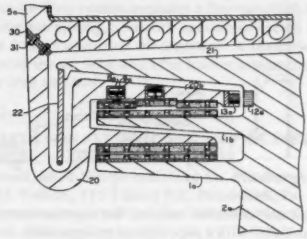
3,791,309
MEANS TO GUIDE AND SUSPEND A VEHICLE BY MAGNETIC FORCES

Max Baermann, 506 Bensberg, Germany

Filed Sept. 17, 1971, Ser. No. 181,523
Claims priority, application Germany, Jan. 19, 1971, 2100839
Int. Cl. B61b *13/08*
U.S. Cl. 104—148 MS 17 Claims

The invention relates to a structure to guide and support a vehicle by magnetic forces which utilizes the repulsive properties of permanent magnets attached to the vehicle and to the support in such a way that like poles are facing each other, which poles extend in the direction of motion, and are of alternating polarity transversely to the direction of motion. The relationship of the permanent magnets to achieve optimum suspension without generation of eddy currents and hysteresis losses is important. Further, the invention achieves lateral sta-

bility of the vehicle utilizing partial permanent magnetic forces and partial electromagnetic forces. The amount of vehicle support by the permanent magnets is mechanically controllable to compensate for environmental factors.



3,791,310

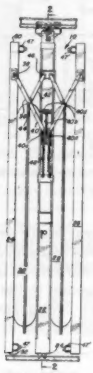
PNEUMATIC SAFETY SYSTEM FOR VEHICLE LADING

Russell M. Loomis, Palos Heights; Samuel H. Enochian, Thornton, and Gerald R. McLaughlin, Chicago, all of Ill., assignors to Unarco Industries, Inc., Chicago, Ill.

Filed Oct. 28, 1971, Ser. No. 193,257

Int. Cl. B60p *7/14*; **B61d** *45/00*

U.S. Cl. 105—369 BA **12 Claims**



A pneumatic force-absorbing bulkhead system for use in freight carrying vehicles is provided by a central bulkhead with lading-engaging panels disposed on opposite sides of the bulkhead with inflatable envelope means positioned between the bulkhead and each of the panels. Y-shaped linkages between the bulkhead and each panel serve to both support the panel from the bulkhead and permit each panel to pitch independently relative to vertical planes, and means are provided on the bulkhead tending to bias each of the panels toward an inoperative position adjacent the bulkhead. Only a single carriage assembly for the bulkhead supports the entire arrangement including the panels.

3,791,311

PNEUMATIC SAFETY SYSTEM FOR VEHICLE LADING

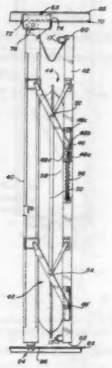
Russell M. Loomis, Palos Heights, Ill., assignor to Unarco Industries, Inc., Chicago, Ill.

Filed Oct. 28, 1971, Ser. No. 193,384

Int. Cl. B60p *7/14*; **B61d** *45/00*

U.S. Cl. 105—369 BA **14 Claims**

A pneumatic force-absorbing bulkhead system for use in freight carrying vehicles is provided by a load-absorbing bulkhead suspended from an overhead transport carriage with the bulkhead supporting therefrom a lading-engaging panel with inflatable envelope means carried by the bulkhead and disposed between the bulkhead and panel. Y-shaped linkages provide a simplified support and expanding linkage between the bulkhead and panel, and in one preferred form the linkage connects adjacent the upper edge of the panel and to the bulkhead to provide means for maintaining the upper edge of the panel substantially within a horizontal plane as the panel moves toward and away from the bulkhead while permitting the panel to pitch relative to a vertical plane, through the pivot connection of the linkage to the panel, to permit the panel to conform to the side of the lading being engaged by the panel.



3,791,312

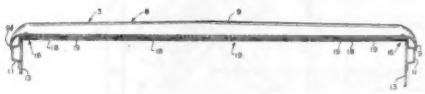
FREIGHT CAR END CONSTRUCTION

Richard C. Snyder, Michigan City, and Donald C. Bodinger, Portage, both of Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Jan. 3, 1972, Ser. No. 214,992

Int. Cl. B61d *17/18*

U.S. Cl. 105—423 **7 Claims**



In a railroad freight car, an end lining on which corrugated sheet is mounted, the end lining comprising a plurality of upright transversely elongated tubular members filled with pulverant materials such as sand or the like, and wherein the adjustable closure member on each lateral side of the end lining being laterally adjustable for attachment to the corner posts of the car, such closure member also being filled with said pulverant material.

3,791,313

WINDBREAKERS ADJUSTABLE MIRROR FOR RAILWAY LOCOMOTIVES

Ralph A. Boudinot, 3002 Robinhood Rd., Houston, Tex.

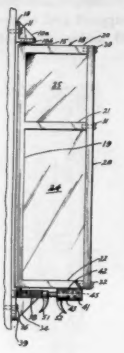
Filed May 30, 1972, Ser. No. 257,856

Int. Cl. B61c *17/00*; **B61d** *49/00*; **B61k** *13/00*

U.S. Cl. 105—456 **7 Claims**

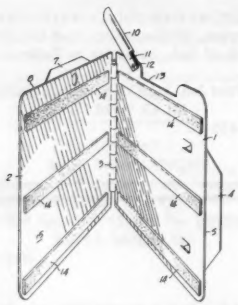
Windbreaker and adjustable mirror apparatus for the cabs of railway locomotives, mountable at the forward side of the cab window on either side of the cab, for preventing wind, dust, rain, and snow from blowing into the cab and from blow-

ing on persons within the cab. The windbreakers have transparent glass at their lower portions, and have mirrors at their



upper portions to serve as rearview mirrors. In one form the rearview mirrors are angularly adjustable.

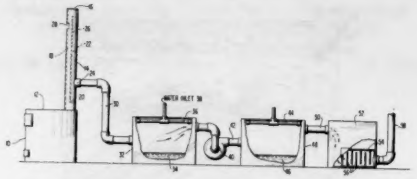
3,791,314
LAP BOARD FOR FLIGHT PERSONNEL
Philip L. Berretta, Castro Valley, Calif., assignor to Donald W. Stegeman, Santa Rosa, Calif.
Filed Feb. 22, 1972, Ser. No. 227,911
Int. Cl. A47b *37/00*
U.S. Cl. 108—43 **2 Claims**



A foldable lapboard which has on its outside a clip to hold flight charts and another clip to hold a tablet, which is so hinged that when unfolded it forms a single board exposing said chart clip and tablet clip for convenient use; means are provided to lock the board in open position, and friction pads of the inner surfaces are exposed on the bottom of the extended board to prevent the slipping of the board from the lap of the pilot.

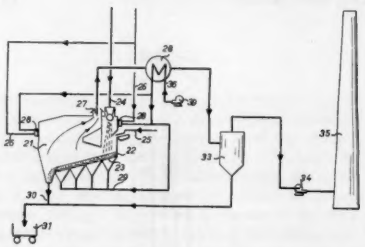
3,791,315
ANTI-POLLUTION DEVICE
Vernie Curtis, Rt. 2, Beaver Dam, Ky.
Filed July 8, 1971, Ser. No. 160,700
Int. Cl. F23g *3/00*
U.S. Cl. 110—8 R **14 Claims**

The invention relates to an anti-pollution system for removing pollutants from the operation of a furnace and includes a power operation recovery and extraction system for the effluvia emitted therefrom and includes as a part of the system fluid treatment chambers and a plurality of filters which form



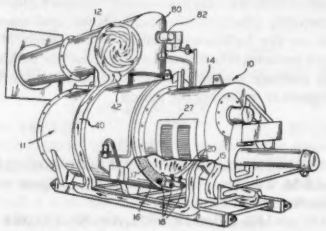
the precipitator-collector means, the various embodiments being combinable with a superheater construction.

3,791,316
APPARATUS FOR BURNING WASTE MATTER
Conrad Sigg, Ackermannstrasse 22, Zurich, Switzerland
Filed Mar. 30, 1972, Ser. No. 239,418
Claims priority, application Switzerland, Apr. 29, 1971, 6300/71
Int. Cl. F23g *5/00*
U.S. Cl. 110—8 R **8 Claims**



Apparatus for burning waste matter in a combustion chamber comprising a feed bed with a plurality of stepped sections. Combustion air is introduced in the region of the transition from one stepped section to the next. The upper sides of the stepped sections are closed and the sections lie on an inclined frame which is connected to a vibrator.

3,791,317
INCINERATOR
Donald J. Schrage, Germantown, and Edward G. Giery, Jr., Glendale, both of Wis., assignors to Aqua-Chem, Inc., Milwaukee, Wis.
Filed May 3, 1972, Ser. No. 249,945
Int. Cl. F23g *5/00*
U.S. Cl. 110—8 R **9 Claims**



An incinerator having a support assembly structure which also conducts combustion air to a main combustion chamber

and an afterburner. Refuse is fed into the main combustion chamber by a compactor which includes a refuse receiving chute having a wall which pivots for refuse compaction. The afterburner air feed system includes a first tangential set of air passages for gas mixing, a venturi section to create a positive draft, and a combustion air feed system. A temperature control regulates the air feed and afterburner temperature by adjusting air feed and fuel.

3,791,318

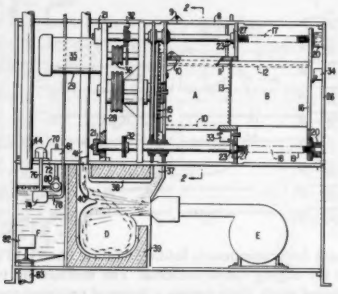
APPARATUS FOR PULVERIZING AND INCINERATING HOUSEHOLD WASTE

Israel Oseroff, 6530 Northumberland St., Pittsburgh, Pa., and Rocco M. Yallum, 115 Tilford Rd., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 248,923, May 1, 1972, abandoned. This application Mar. 30, 1973, Ser. No. 346,620

Int. Cl. F23g *5/12*

U.S. Cl. 110—8 R **11 Claims**



Apparatus for totally reducing refuse, such as paper, cardboard, plastics, tin cans and glass, into a granular state of such fine grit that it can then be explosively ignited and reduced further to a smokey remain. This smokey remain is then condensed by a chemical wash and directed to a liquid tank, from which the liquid is flushed away into the sewage system.

3,791,319

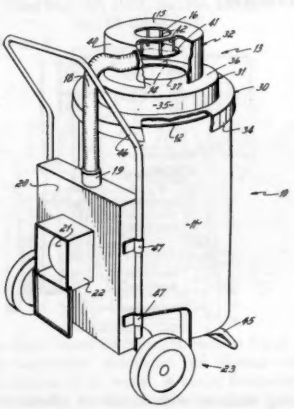
INCINERATOR

David H. Trott, Cincinnati, Ohio, assignor to Burns Investment Corp., Cincinnati, Ohio

Filed May 25, 1972, Ser. No. 256,825

Int. Cl. F23g *5/00*

U.S. Cl. 110—18 R **6 Claims**



An incinerator whose top has a tangential inlet for combustion air and a central exhaust opening. A baffle plate is supported below the exhaust opening to divert upwardly moving particles to the perimeter of the top, thereby increasing their residence time and hence the completeness of their combustion. A blower is mounted on the outside wall of the plenum chamber adjacent the combustion chamber. The blower drives air through the plenum chamber to the inlet.

3,791,320

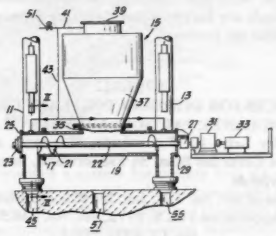
POLLUTION-FREE COAL CHARGING APPARATUS

Ward F. Gidick, West Newton, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Dec. 20, 1972, Ser. No. 317,077

Int. Cl. F23k *3/00*

U.S. Cl. 110—101 R **6 Claims**



A coal charging larry car is provided with a combination lid lifting and drop sleeve apparatus that provides a gas-flow passageway from an oven to be charged with coal to another oven twice removed in which coal is coking. A reversible screw conveyor feeds coal into either oven as preferred.

3,791,321

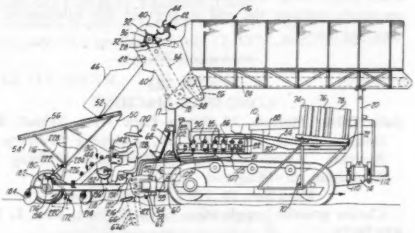
AUTOMATIC PLANTING SYSTEM

Masato Tsutsumi, Kahului, Hawaii, assignor to Maui Land & Pineapple Company, Inc., Kahului, Maui, Hawaii

Filed Apr. 5, 1972, Ser. No. 241,349

Int. Cl. A01c *11/00*

U.S. Cl. 111—3 **24 Claims**



A system for automatically planting pineapple plants or the like combining into a single continuous operaton the steps of applying fertilizer and fumigants to the soil, laying mulch paper on the ground and planting the plants either as crowns, slips or suckers. The apparatus, which includes two independent planting machines, lays the plants in multiple rows having crowned beds separating the rows. Because the configuration of the machines, they can accommodate varying terrain and differing grades as well as curving the rows without difficulty. Pre-punched mulch paper is fed from a roll over a supporting deck where individual plants are inserted by hand through the hole in the paper. The deck is provided with channels to accommodate the stub ends of the plants. The deck is slanted toward the ground and the channels extend to form plow shares whereby the mulch paper with the plants inserted is fed

toward the ground off the back of the plowshares so that the point of plant insertion into the soil is located immediately behind the plow where the furrows are open. The apparatus is coupled to a prime mover at one end and supported by a number of drive wheels at the other, the wheels of each machine being differentially powered by an hydraulic system whereby the wheels are always driven at a ground speed equal to that of the prime mover. The wheels supporting the back end of the machines properly gauge the plows to give uniformly deep furrows regardless of any unevenness of the terrain and the wheels are so spaced as to engage the mulch paper strips along the edges thereof to drive out the paper at actual ground speed. The supporting wheels also form a tuck on the edge of the paper and compact the soil around the seeds. Tuck improves paper covering. A floating set of driven moon wheels mounted at the back end form the crowned beds between the rows and compact the soil around the plants. Presser wheels are also provided to assure proper insertion of the plants into the furrows.

3,791,322

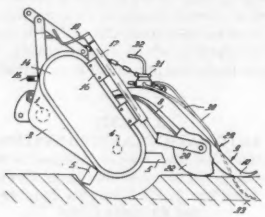
DEVICES FOR INTRODUCING PLANT GROWTH STIMULANTS, PARTICULARLY FERTILIZERS

Ary van der Lely, 10 Weverskade, Maasland, and Cornelis Johannes Gerardus Bom, 36 Esdoornlaan, Rozenburg, both of Netherlands

Division of Ser. No. 134, Jan. 2, 1970, abandoned. This application Feb. 8, 1972, Ser. No. 224,592

Int. Cl. A01c *23/02*

U.S. Cl. 111—7 **10 Claims**



A device for introducing substances, such as fertilizers in the soil includes a wheeled frame supporting a dispenser with a soil penetrating tube and a soil working member that subsequently agitates the soil to prevent the substances from escaping the soil.

3,791,323

LONG SEAM MACHINE

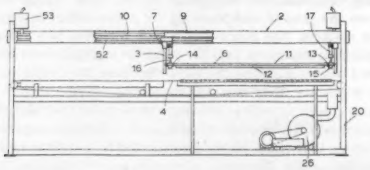
John Oliver Pierson, 25 Downs Park West, Bristol; Roger Douglas White, 36 Horse St., Chipping Sodbury, and Bertram Keith Brown, Myllendonk, Medway Dr., Keynsham, all of England

Filed Nov. 29, 1972, Ser. No. 310,456

Claims priority, application Great Britain, Dec. 1, 1971, 55828/71

Int. Cl. D05b *21/00*

U.S. Cl. 112—121.15 **10 Claims**



A long seam apparatus comprising loading and seaming stations for seaming sheet material, having a seaming device at the seaming station and a feeding device at the loading station. The feed device has a drive member and a driven member; the drive member being movable between an idle position in which the drive and driven members are out of contact, and a drive position in which the drive and driven members are in driving engagement with material supplied to the feed device gripped between the drive and driven members which are thereupon movable from the loading station to the sending station.

3,791,324

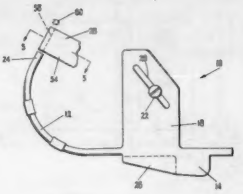
FOLDING MECHANISM

Charles R. Shulman, Swampscott, Mass., assignor to Randy Mfg. Co., Inc., Randolph, Mass.

Filed Sept. 8, 1972, Ser. No. 287,478

Int. Cl. D05b *35/06*

U.S. Cl. 112—138 **4 Claims**



A means for continuously folding a fabric band into a shape adapted for edging fabric material. The mechanism includes an elongated guide plate having a series of retaining means for securing the band against the guide plate as it moves lengthwise. A first fold means bends or folds opposite edges of the band towards one another and over a core element. A second fold means or former which is positioned at the end of the guide plate to receive the twice-folded band, includes a narrow channel adapted to receive a portion of the band intermediate the two first-formed folds to effect a third fold.

3,791,325

SEWING MACHINE

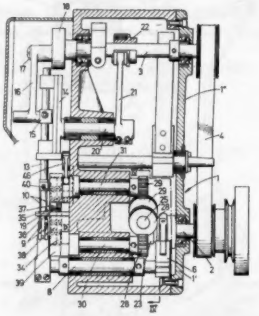
Alphose De Koninck, Avenue Sleeckx 84, Schaerbeek, Belgium

Filed May 9, 1972, Ser. No. 251,643

Claims priority, application Belgium, June 7, 1971, 104320

Int. Cl. D05b *27/10, 27/20*

U.S. Cl. 112—213 **4 Claims**



A sewing machine with a pair of wheels for conveying material layers to be joined by stitching. The conveying wheels are arranged in the stitch-forming area with each wheel associated with a member for driving said wheel continuously

with the same peripheric speed. To the needle block are associated members driving said block alternately along the conveying direction. One of said wheels is retractable to allow feeding of the material layers to be joined by stitching.

3,791,326

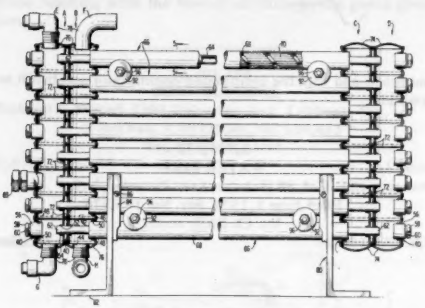
METHOD OF FORMING A MODULAR HEADER FOR A TUBE WITHIN A TUBE HEAT EXCHANGER

Leonard H. Schwarz, West Hartford, Conn., assignor to Dunham-Bush, Inc., West Hartford, Conn.

Division of Ser. No. 52,902, July 7, 1970, Pat. No. 3,705,622. This application Dec. 8, 1971, Ser. No. 205,986

Int. Cl. B21d *53/02*; B23p *15/26*

U.S. Cl. 113—118 R 2 Claims



Inner and outer headers at both ends of a tube within a tube heat exchanger are formed of a plurality of axially stacked and brazed drawn metal tubular shell segments. Segments for all headers are identical and carry axially aligned large diameter and small diameter holes on opposite sides thereof for facilitating reception of the inner tube coupling the outer headers and the outer tube coupling the inner headers as well as bushings receiving removable plugs to facilitate cleaning of the interior of the inner tubes of the heat exchanger tube assemblies.

3,791,327

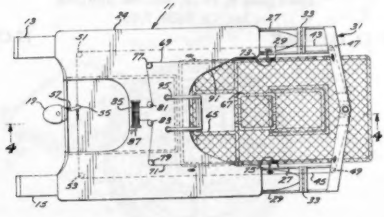
MARINE DIVER VESSEL

Frank P. Deveney, 5141 Carita, Long Beach, Calif.

Filed Mar. 29, 1972, Ser. No. 239,235

Int. Cl. B63g *8/00*

U.S. Cl. 114—16 R 6 Claims



A marine diver vessel including a buoyed frame having a diver's well suspended therefrom for normal submersion beneath the surface of the water. A motor is mounted on the frame and a steering handle is accessible from the well so a diver can partially submerge in such well and perform such functions as strapping an aqua lung to his back while being protected from the surrounding environment and can also steer the vessel from such well.

3,791,328

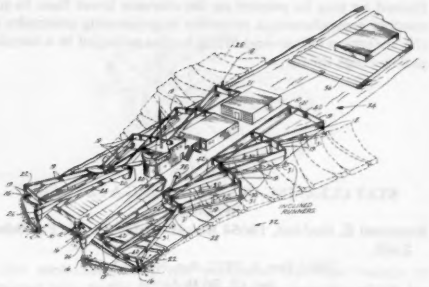
ICE REMOVAL TRACK

Joseph F. Schirtzinger, Pasadena, Calif., assignor to Air Logistics Corporation, Pasadena, Calif.

Filed June 19, 1972, Ser. No. 263,988

Int. Cl. B63b *35/12*

U.S. Cl. 114—42 7 Claims



There is provided a system for cutting thin ice ahead of a vessel into essentially triangular shaped blocks and moving the ice blocks under the surface of the ice. The system consists essentially of a centrally located ice cutter mounted on a vessel, two pivoting ice cutters which traverse a path between the central ice cutter and the extremities of an expanded framework mounted on port and starboard sides of the vessel. Each framework also contains a cutter which intersects the path cut by the traversing ice cutters. By their cooperative action, the ice is cut into a series of triangular shaped blocks which separate the blocks about the centerline of the vessel. The framework on the port and starboard sides of the vessel then acts to progressively move the blocks away from the vessel and under the surface of the ice providing an open water path through the ice which exceeds the width of the path provided.

3,791,329

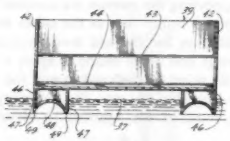
LIFT STRUCTURE

Paul F. Bruning, Altadena, Calif., assignor to Electronic Machining Company, Pasadena, Calif.

Continuation-in-part of Ser. No. 4,796, Jan. 22, 1970, Pat. No. 3,653,609. This application July 12, 1971, Ser. No. 161,443

Int. Cl. B63b *1/20*

U.S. Cl. 114—66.5 R 17 Claims



A lifting body in the general form of approximately a semicylinder is connected to the fuselage of an aircraft for providing lift during flight. The lifting surface is substantially free of camber and is concave on its lower face in a direction transverse to the flight direction so that with a small angle of attack a large volume of air is effectively trapped beneath the lifting body, and the side edges minimize loss of air laterally thereby providing lift over substantially all of the lifting surface. The lifting body has a length along the direction of flight greater than the width transverse to the direction of flight for providing a low aspect ratio. Conventional elevators and a rudder are provided for control. In another embodiment the lifting body is formed in a helical shape for acting in the manner of a

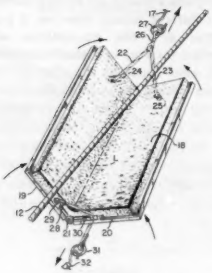
propeller and in another embodiment a fuselage is integrally connected with the lifting body in an arrangement where the lifting body also has capacity for helium for lighter than air flight.

In another embodiment the lifting body is provided along each side edge of a boat so as to provide lift as the boat moves through the water. In such an arrangement the lifting body is substantially continuously wetted and only incidental entrained air may be present on the convace lower face. In still another embodiment, a propeller incorporating principles of this invention has several lifting bodies arranged in a circular path for high thrust.

3,791,330
STAY CLEANING DEVICE HAVING A FOLDABLE SPONGE

Raymond E. Haddad, 18054 Bluesail Drive, Pacific Palisades, Calif.

Filed Dec. 6, 1972, Ser. No. 312,689
Int. Cl. B63b *59/00*
U.S. Cl. 114—221 **7 Claims**



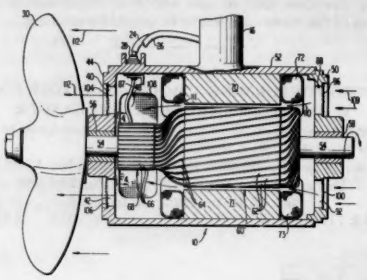
A sponge is mounted on base members in such a manner that it may be folded into a V-shape. A sailboat stay or guy wire can be received between the opposing surfaces of the sponge when folded into a V-shape so that movement of the sponge along the stay or guy wire will clean the same. The base members supporting the sponge are coupled to a halyard line at one end and a tether line at the other end in such a manner that pulling on the halyard tends to close the base members and sponge into the V-shape to apply a wiping force against the stay. By using the halyard to pull the device along the stay over the length of the stay, the necessity of a person climbing up the mast of the sailboat to clean the stay is avoided.

3,791,331
ELECTRIC OUTBOARD MOTOR

Earl H. Dilley, 5900 Chestnut Hill Rd., College Park, Md.

Continuation-in-part of Ser. No. 113,411, Feb. 8, 1971. This application May 5, 1972, Ser. No. 250,542
Int. Cl. B63h *21/26*
U.S. Cl. 115—17 **15 Claims**

A battery-operated submersible electric outboard motor having apertures in the motor housing which permit the environmental water in which the boat is floating to flow through the internal motor structure in direct contact with the field

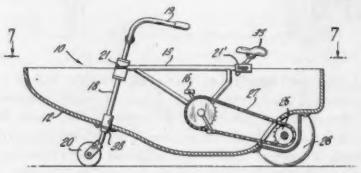


and rotor, and with the uninsulated commutator and brush assemblies.

3,791,332
WATER BIKE

Mohammed S. Gof, 89 Haledon Ave., Paterson, N.J.

Filed June 1, 1971, Ser. No. 148,526
Int. Cl. B63h *16/00*
U.S. Cl. 115—27 **2 Claims**

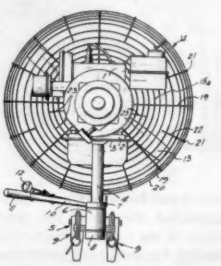


A vehicle in the form of a water bicycle for use either over land or water, which comprises the combination of a pair of passenger-carrying side boats operably connected with a centrally disposed bicycle member that provides the necessary driving force to propel the vehicle over land and water and alternatively, a single passenger-carrying boat propelled by a bicycle centrally disposed therein.

3,791,333
AIR MOTOR

Joseph D. Losch, Mechanicsburg, Pa., assignor to Susquehanna Air Motors, Inc., Mechanicsburg, Pa.

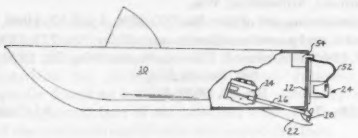
Filed June 5, 1972, Ser. No. 259,748
Int. Cl. B63h *7/02*
U.S. Cl. 115—34 R **12 Claims**



A guard structure for the air-moving propeller of a marine air motor for over-water propulsion utilizing a combustion en-

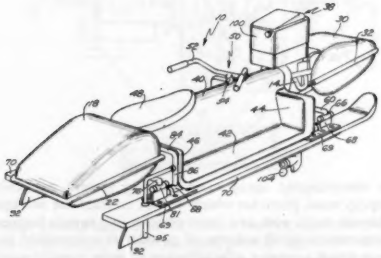
gine operatively connected to such propeller for rotating the same, in which the guard structure is constructed from wire stock and provided with a configuration to operatively enclose the propeller at opposite sides and at the outer ends of the propeller as it rotates, the guard being constructed from wire stock formed into a plurality of convolutions connected by radially extending reinforcing ribs of wire stock, with the ribs being rigidly secured to the respective convolutions at their intersections therewith, the convolutions of the guard structure comprising at least two groups, each having a plurality of convolutions, with the convolutions of each group being formed from a respective single length of wire stock to form a vibration-resistant structure, the convolutions and ribs of the guard structure being provided with a coating of suitable material operable to protect the wire stock forming the structure from exposure to the elements and simultaneously therewith reduce noise resulting from the flow of air through the guard structure.

3,791,334
BOAT REVERSE
Richard E. Wetzel, 5301 University Ave., Lubbock, Tex.
Filed Feb. 5, 1973, Ser. No. 329,833
Int. Cl. B63h *25/48*
U.S. Cl. 115—35 **6 Claims**



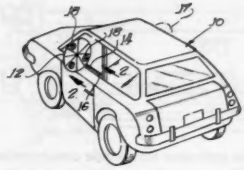
A deflector is mounted for vertical reciprocation upon the transom of an inboard motor boat with fixed propeller. A vane within the deflector directs water to the port or starboard water course for steerage.

3,791,335
SELF-PROPELLED WATER RECREATIONAL VEHICLE
Michael Del Vecchio, 140 Regent Ave., Providence, R.I.
Filed July 12, 1972, Ser. No. 271,113
Int. Cl. B63b *35/00*
U.S. Cl. 115—70 **9 Claims**



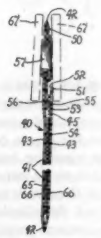
A self-propelled recreational vehicle for use in water and including spaced skis that are interconnected for pivotal movement, the pivotal movement of the skis being accomplished by a steering mechanism interconnected thereto; and a motor assembly mounted on a support to which the skis are interconnected and extending between the skis to provide the propelling movement for the device.

3,791,336
TRAFFIC SIGNALING DEVICE FOR VEHICLES
David M. Zdebski, 5416 S. Nordica Ave., Chicago, Ill.
Filed July 26, 1973, Ser. No. 382,774
Int. Cl. B60q
U.S. Cl. 116—28 R **16 Claims**



The embodiment of the invention disclosed herein is directed to a traffic signaling device for vehicles which includes a bracket having a first end arranged for connection to the upper free exposed edge portion of a partially opened side window of the vehicle. The bracket has the second end thereof arranged for connection in a simple and easy manner to the distress signaling reflective warning device. A collapsible distress signaling reflective warning element is formed of a plurality of triangularly shaped segments, each segment including a given apex thereof in common registry with other segments so that the plurality of triangularly shaped segments can be secured together at the given apex by means of a locking bolt or rivet. A mounting bar is also secured to the locking bolt or rivet and provides means for connection to the bracket which, in turn, provides a relatively small, collapsible and somewhat compact and easily partially disassemblable structure which can be stored when not in use in small places such as glove compartments, or the like, and which can be opened and placed in a signalling location on the window from inside the vehicle without the driver having to exit from the vehicle.

3,791,337
SIGNALING DEVICE
Charles H. Schamblin, 1714 South M St., Bakersfield, Calif.
Filed Feb. 26, 1973, Ser. No. 335,658
Int. Cl. B60q
U.S. Cl. 116—28 R **1 Claim**



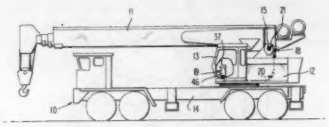
A signaling device for a vehicle having a flexible envelope with transparent walls, a sheet of luminous material housed within the envelope in registry with the walls, and a bracket for fastening the envelope on a vehicle in a position to be fluttered by movement through the air.

3,791,338

BOOM ANGLE INDICATOR

Joseph H. Keller, Jr., Hagerstown, Md., assignor to Walter Kidde & Company, Inc., Clifton, N.J.

Filed July 11, 1972, Ser. No. 270,671
Int. Cl. G09f 9/00
U.S. Cl. 116—124 F 9 Claims



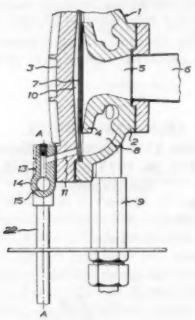
A boom angle indicator for mobile construction cranes and the like embodies a sending unit mounted directly on the boom pivot shaft and a coacting boom angle display unit in the operator's cab. The two units are operatively coupled through a simple push-pull cable with substantially zero play or backlash. The indicator includes means to compensate for a non-level condition of the crane carrier, whereby the indicated boom angle is referenced to the horizontal.

3,791,339

CONTROL MECHANISMS FOR STEAM DRIVEN DIAPHRAGM VALVE SOUND TRANSMITTERS

Nils Axel Viktor Dahlquist, Malmo, Sweden, assignor to Kockums Mekaniska Verkstads AB, Malmo, Sweden

Filed Sept. 26, 1972, Ser. No. 292,372
Claims priority, application Sweden, Sept. 27, 1971, 12168/71
Int. Cl. G10k 9/00
U.S. Cl. 116—142 R 2 Claims



A control mechanism for a steam driven sound transmitter of the type having a valve diaphragm which during signalling oscillates relative to a seat and periodically opens and closes the communication for the steam between an inlet chamber and an outlet passage opening into a resonance horn but which, when no signal is to be generated, is blocked against the seat by the action of the steam pressure in a back pressure chamber located behind the diaphragm, comprises a valve housing with a cavity, steam passages connecting the inlet chamber and the back pressure chamber with said cavity, a drain passage connecting said cavity with a drainage tank, and a valve-controlled relief passage connecting said cavity with the atmosphere, said passage between the inlet chamber and said cavity having a minimum cross-sectional area which is smaller than the minimum cross-sectional area of the relief passage but greater than the minimum cross-sectional area of the drain passage.

3,791,340

METHOD OF DEPOSITING A METAL PATTERN ON A SURFACE

Anne Marie Ferrara, Princeton, Mercer County, N.J., assignor to Western Electric Company Incorporated, New York, N.Y.

Filed May 15, 1972, Ser. No. 253,532
Int. Cl. B44d 1/50
U.S. Cl. 117—47 A 11 Claims

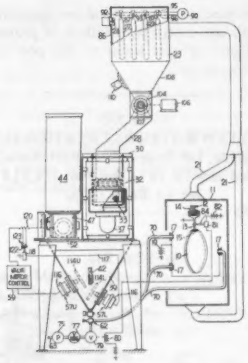
A method of depositing a metal pattern on a surface of a substrate is disclosed. A surface of the substrate is sensitized with a photosensitive palladium sensitizer. The sensitized surface is exposed to a source of ultraviolet radiation to delineate an unexposed pattern corresponding to the desired metal pattern. The selectively ultraviolet radiation-exposed surface is then immersed in a suitable electroless metal deposition solution wherein an electroless metal is catalytically reduced on the delineated unexposed pattern.

3,791,341

ELECTROSTATIC RESIN POWDER SPRAY SYSTEM

Harold G. Diamond, Wexford, and Floyd L. Gustine, Pittsburgh, both of Pa., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Continuation-in-part of Ser. No. 722,078, April 17, 1968, abandoned, and a continuation-in-part of Ser. No. 728,253, May 10, 1968, abandoned. This application May 28, 1970, Ser. No. 41,228
Int. Cl. B05b 5/02
U.S. Cl. 118—7 31 Claims



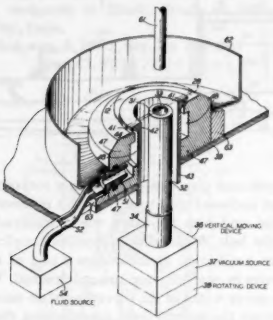
An electrostatic spray resin coating system recirculates overspray resin particles which do not contact the workpiece and blends them with new resin powder in a supply hopper. A predetermined small volume of powder is maintained in the hopper which contains a distribution of resin powder particle sizes that will not suffer elutriative separation, assures uniform coating, and prevents obstructions caused by compaction of the powder. Means for detecting the workpiece opposite the spray nozzle controls the supply of powder to the nozzle and minimizes the amount of overspray which contains a high proportion of coarse particles, and powder level detecting means responsive to the volume of new and recirculated powder in the supply hopper controls the supply of new powder mixed with the overspray in the supply hopper.

3,791,342

SELECTIVE COATING

Lynn Forrest Boyer, Reading, and Anderson Forbes Johnson, Jr., Sinking Spring, both of Pa., assignors to Western Electric Company, Incorporated, New York, N.Y.

Division of Ser. No. 95,821, Dec. 7, 1970, Pat. No. 3,695,928. This application June 6, 1972, Ser. No. 260,087
Int. Cl. B05c 11/08
U.S. Cl. 118—52 7 Claims



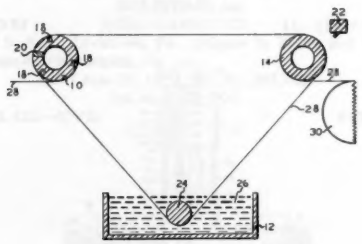
A rotatable vacuum spindle supports a substrate thereon. Means coat the substrate on the non-supported face. Means rotate the spindle and substrate thereon at a speed whereby to distribute the coating material. Means disposed about the spindle direct an annular fluid stream outwardly and against the supported face of the substrate whereby to prevent creep of the coating material onto said supported face.

3,791,343

WIRE PLATING APPARATUS

Charles M. Starks, and Larry H. Hood, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Division of Ser. No. 815,690, April 14, 1969. This application Oct. 14, 1971, Ser. No. 189,326
Int. Cl. B05c 11/12
U.S. Cl. 118—60 3 Claims



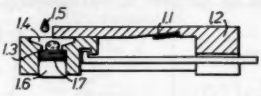
Wire plating apparatus includes a heating drum to which the wire to be coated is continuously passed, and from which it is passed continuously through an alkyl aluminum plating solution. From the plating solution, the wire is placed around a rinsing drum where it is rinsed with a hydrocarbon spray. The wire from the rinsing drum is then passed back around the heating drum, and back through the same path as during the previous cycle. Thus, the number of wraps around the heating drum is determinative of the number of heating, plating and rinsing cycles carried out, and these cycles are carried out automatically in the described apparatus.

3,791,344

APPARATUS FOR LIQUID PHASE EPITAXY

Wolfgang Gramann, Gemunden, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Division of Ser. No. 67,534, Aug. 27, 1970, abandoned. This application Aug. 14, 1972, Ser. No. 280,268
Claims priority, application Germany, Sept. 11, 1969, 1946049; Sept. 11, 1969, 6935720
Int. Cl. H01l 7/00
U.S. Cl. 118—421 5 Claims



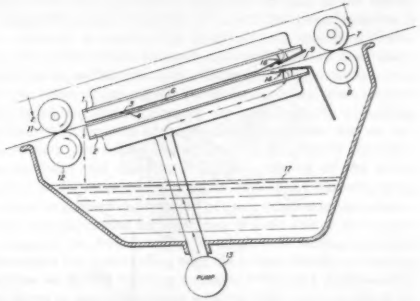
Apparatus for liquid phase exitaxy includes a refractory tubular vessel rotatable about it longitudinal axis and supportive of a substrate on an upper wall. A crucible is longitudinally movable from a position external to a confining wall of the vessel, whereby to be charged, to a position whereby to be sealed by said wall. Means rotate the vessel 180° and effect further inward movement of the crucible whereby to effect contact between the substrate and growth material.

3,791,345

LIQUID TONER APPLICATOR

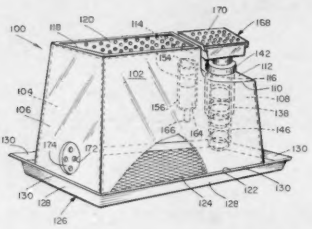
James T. McCutcheon, Rochester, N.Y., assignor to Itek Corporation, Lexington, Mass.

Filed May 9, 1972, Ser. No. 251,670
Int. Cl. G03g 13/10
U.S. Cl. 118—637 15 Claims



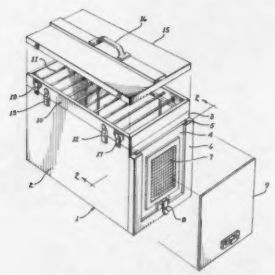
A developer apparatus is disclosed which comprises a pair of electrically conductive fluid applicators which are separated from one another by a very narrow passageway. A charge-image bearing member passes through the passageway while relatively rapid moving bodies of liquid toner passes over both upper and lower surfaces of the charge-image bearing member. The flow rate of the liquid toner is relatively high so that a very small gap may be employed between the applicators and yet the imaging member will not contact the opposed surfaces of the passageway due to the effect of the moving liquid. The velocity of the liquid toner is also high in order to supply large amounts of toner for developing large solid black areas even though the applicator itself is not very long. Electrical connections are made between the pair of fluid applicators so that they act as development electrodes in eliminating the fringing effect.

3,791,346
RODENT HABITAT
Allan H. Willinger, New Rochelle, and Albert J. Dinnerstein, Far Rockaway, both of N.Y., assignors to Metaframe Corporation, Maywood, N.J.
Filed Jan. 21, 1972, Ser. No. 219,767
Int. Cl. A01k *1/00*
U.S. Cl. 119—17 39 Claims



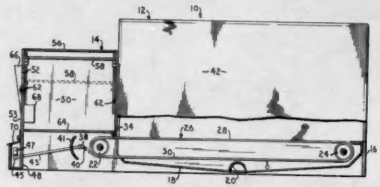
A rodent habitat comprising a transparent plastic housing which includes an open bottom portion. A screen is connected across the open bottom portion of the housing, whereas a shallow tray is provided for receiving the open bottom portion of the housing in detachable relation. An arrangement of adjustable tubes and sub-housing structures are provided for detachable association with the transparent housing and mutual communication with one another.

3,791,347
ANIMAL HANDLER
Melvin V. Lovell, 12433 N. 70th St., Scottsdale, Ariz.
Filed Apr. 30, 1973, Ser. No. 355,771
Int. Cl. A01k *01/02*
U.S. Cl. 119—19 7 Claims



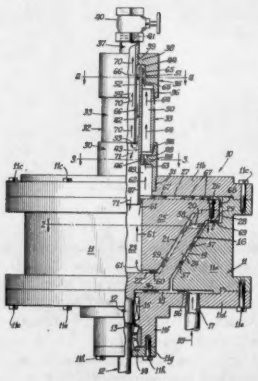
A plurality of bars are mounted within a pivotable frame across the top of an animal carrier to provide ventilation and light. By pivoting the frame, the animal can be taken out of the carrier and the interior of the carrier is readily accessible for cleaning purposes. A cover, including a handle, is releasably attached to the frame to darken the interior of the carrier and protect the animal while it is being transported. One end of the carrier includes a laterally sliding panel through which food and water can be supplied to the animal. The entire floor of the carrier is slidably movable toward the bars and is properly aligned by guide means. With the cover removed and the carrier laid on its side, the animal can be immobilized against the bars by moving the floor toward the bars. Thus, medication or medical treatment can be administered to the animal without removing it from the carrier or attaching restraining devices to the animal.

3,791,348
AUTOMATED DOG KENNEL
Paul J. Marnett, 457 N. 17th St., Kansas City, Mo.
Filed Nov. 24, 1972, Ser. No. 309,230
Int. Cl. A01k *01/00*
U.S. Cl. 119—19 6 Claims



An automated dog kennel utilizes a rotatable belt for the floor of an enclosed structure. The belt is movable to exercise the animal and also to carry waste material into a drain beneath the belt. A plurality of nozzles coupled with a water source are positioned at the forward end of the belt as the latter rotates in one direction toward this end. The nozzles are placed to spray water in the direction of an animal on the belt to discourage the animal from approaching the end and thus prevent the animal from getting a leg caught between the moving belt and supporting framework. These nozzles may also serve to pre-soak the belt to facilitate removal of waste material. A second set of nozzles is positioned adjacent the belt to spray the belt with additional cleaning liquid subsequent to the spray of the first set of nozzles as the belt rotates. An enclosed housing for protecting the animal from the elements is disposed adjacent the belt and in communication with the enclosed structure. The housing includes a bottom, sidewalls, and a movable roof which is positioned at a height sufficient to accommodate the animal beneath it when the animal is in a lying position while preventing the animal from assuming a standing position. This forces the animal to leave the housing and stand on the rotatable belt for defecation or urination.

3,791,349
STEAM GENERATOR
Carl D. Schaefer, Chicago, Ill., assignor to Sonaqua Inc., Chicago, Ill.
Filed Jan. 29, 1973, Ser. No. 327,430
Int. Cl. F22b *3/06*
U.S. Cl. 122—11 15 Claims



An apparatus and method for the production of steam and pressure by the intentional creation of shock waves in a

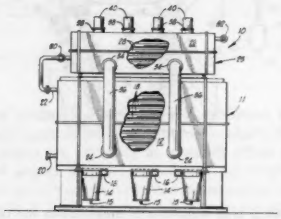
distended body of water. The created shock waves are in the nature of water hammer and it is this water hammer which is repeated and intensified to such an extent the heat and pressure developed in the water converts the water into usable steam.

3,791,350

APPARATUS FOR HEATING FLUIDS

Harold O. Ebeling, and Richard A. Beets, both of Oklahoma City, Okla., assignors to Black, Sivalls & Bryson, Inc., Oklahoma City, Okla.

Filed Aug. 3, 1972, Ser. No. 277,682
Int. Cl. F22b *21/24*
U.S. Cl. 122—356 **7 Claims**



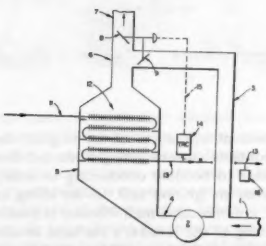
The present invention relates to an improved fluid heater apparatus of the type having walls defining a furnace space, a plurality of heating tubes passing through the furnace space and one or more high intensity combustion burners attached to and positioned with respect to the furnace space so that combustion gases are directed under super-atmospheric pressure into the furnace space and circulated around the heating tubes thereby causing the transfer of heat to the fluid being heated. By the present invention walls defining a secondary furnace space, a second plurality of heating tubes and means connecting between the primary and secondary furnace spaces are provided so that spent combustion gases from the primary furnace space flow through the secondary furnace space under super-atmospheric pressure and additional heat is transferred from the spent combustion gases to the fluid being heated.

3,791,351

DESUPERHEATER

Harry S. Kent, Levittown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed June 30, 1972, Ser. No. 267,765
Int. Cl. F22g *5/00*
U.S. Cl. 122—479 D **5 Claims**



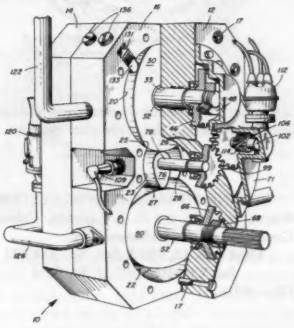
A fluid desuperheater including a housing for a heat-exchanger having a tube, conduit or pipe for the passage of superheated fluid, such as steam, therethrough, an air inlet duct, air feeding means, and air outlet duct and a by-pass duct, the amount of air being bypassed from the outlet to recycle being controlled by interconnected valves controlled by outlet fluid temperature.

3,791,352

ROTARY EXPANSIBLE CHAMBER DEVICE

Andrew Takacs, 99 Farm Road Cir., Brunswick, N.J.

Continuation of Ser. No. 106,351, Jan. 14, 1971, abandoned, which is a continuation-in-part of Ser. No. 854,328, Aug. 28, 1969. This application Oct. 25, 1972, Ser. No. 300,652
Int. Cl. F02b *53/00*
U.S. Cl. 123—8.25 **33 Claims**



A rotary engine comprises a block, a plurality of longitudinally extending cylindrical chambers formed in the block, the longitudinal axes of which are in parallel spaced relation, a rotor disposed in each of the longitudinally extending chambers, each of the rotors having a peripheral surface in substantial surface-to-surface contact with the peripheral surface of at least one other of the rotors, intake and exhaust ports formed in the block for communicating the longitudinally extending chambers with sources of combustible materials and an exhaust system, the intake and exhaust ports of each chamber being covered and uncovered by the rotation of the rotor mounted in the respective chamber, means for interengaging the rotors to control the rotation of each relative to the others, ignition means, means for attaching at least one of the rotors to a means to be driven, and relieved portions formed on each of the rotors for cooperating with the longitudinally extending chambers to define working volumes which are displaceable from being in communication with the inlet ports to being in communication with the ignition means and thereafter to being in communication with the exhaust ports during each combustion cycle of the engine.

3,791,353

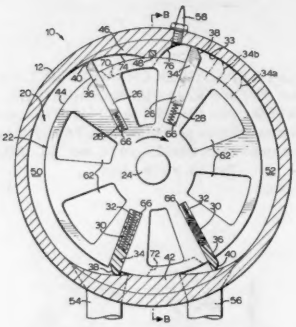
ROTARY ENGINE

Herbert C. Catherwood, Hamilton, Ontario, Canada, assignor to William N. Histed, Hamilton, Ontario, Canada, a part interest

Filed June 16, 1972, Ser. No. 263,463
Int. Cl. F02b *53/00*
U.S. Cl. 123—8.33 **13 Claims**

A rotary engine of the vane type is designed to achieve smooth efficient power output with minimum wear of vanes

and casing walls. This is achieved by transferring compressed air-fuel mixture from one zone to an ignition zone and providing an expansion zone which increases in volume in regular manner during rotation of the rotor after ignition.



3,791,354

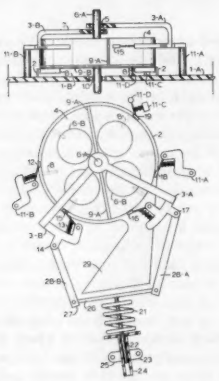
ENGINE CHARGE TIMING SYSTEM

Connie Wayne Lorentz, c/o E. J. Lorentz, Coleman Country Club, Gouldsbrook Rt., Coleman, Tex.

Filed Dec. 12, 1972, Ser. No. 314,421

Int. Cl. F01l *9/02, 1/34, 9/04*

U.S. Cl. 123—90.12 **9 Claims**



In a system for opening and closing poppet valves in an internal combustion engine, a pulser rotates at one-quarter engine speed to excite magnetic pickups which control the opening and closing of poppet valves through bistable multivibrators, amplifiers and solenoids which control hydraulic pilot valves to selectively open hydraulic lines for driving the poppet valve open or closed and holding the poppet valve in that condition for a predetermined time. Four pickups are associated with a pulser station for one cylinder. Two pickups control the exhaust poppet valve, and two pickups control the intake valve. The exhaust opening pickup and the intake valve closing pickup respectively are advanced and retarded with increased speed. The hydraulic pilot valve system may be cascaded to provide sufficient power to drive the poppet valves.

3,791,355

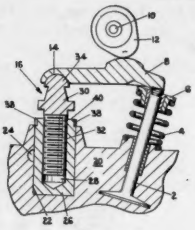
MECHANICAL LASH ADJUSTER FOR OVERHEAD CAM ENGINES

Paul F. Bergmann, North Muskegon, and David L. Coates, Muskegon, both of Mich., assignors to Johnson Products, Inc., Muskegon, Mich.

Filed Feb. 24, 1972, Ser. No. 229,119

Int. Cl. F01l *1/18, 1/20*

U.S. Cl. 123—90.27 **5 Claims**



Mechanical lash adjustment mechanism for use as a direct replacement for a hydraulic lash adjuster in overhead cam engines and the like. The lash adjuster includes a stud threaded into an insert and having means at one end for supporting a rocker arm. The insert is designed to fit directly into an opening provided in a conventional engine head which opening normally accommodates a hydraulic lash adjuster.

3,791,356

DEVICE FOR CONTROLLING IGNITION TIMES FOR INTERNAL COMBUSTION ENGINE

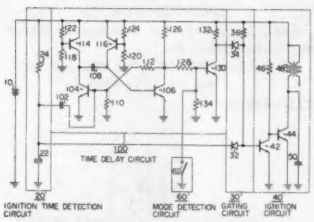
Toshikazu Saita, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 27, 1971, Ser. No. 183,960

Claims priority, application Japan, Sept. 28, 1970, 45-84908

Int. Cl. F02p *5/04, 1/00*

U.S. Cl. 123—117 R **3 Claims**



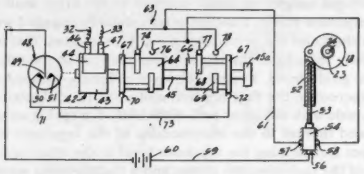
In the normal operation of an engine, the opening of breaker's contacts causes a gating diode and therefore an ignition transistor to become conducting to induce an ignition voltage across an ignition coil. In the idling and low speed operations, a monostable multivibrator is enabled to respond to the opening of the breaker's contacts to conduct another gating diode after a time interval for which the multivibrator is in its semistable state resulting in the generation of an ignition voltage. In the semistable state a capacitor included in the multivibrator discharges through a transistor serving to maintain the discharge current constant.

3,791,357

ELECTRICAL MEANS FOR VARYING SPARK TIMING OF AN INTERNAL COMBUSTION ENGINE

Harvey A. Cook, Cleveland, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Dec. 15, 1971, Ser. No. 208,144
Int. Cl. F02p 5/04
U.S. Cl. 123—117 R 11 Claims



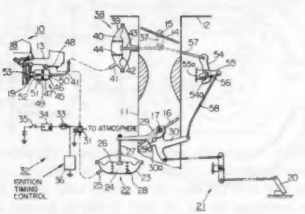
An ignition system for an internal combustion engine including a multi-breaker point distributor in which the respective sets of points are arranged at mutually offset and overlapping dwell angles. Electric circuitry is provided to selectively connect and disconnect the various sets of points to vary the total length of dwell and thus the ignition timing. A commutator can be used to alternately connect and disconnect the various sets of points, thereby continuously and relatively advancing and retarding the ignition timing between predetermined limits from a variable zero position. A sensing device can be employed to sense variations in an engine operating condition and relatively advance or retard the zero position of the ignition timing to maintain a predetermined value of the operating condition.

3,791,358

CARBURETOR CONTROL MECHANISM FOR AN AUTOMOTIVE GASOLINE POWERED INTERNAL COMBUSTION ENGINE

Kenji Masaki, and Hiroyuki Maruoka, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Nov. 21, 1972, Ser. No. 308,561
Claims priority, application Japan, Dec. 8, 1971, 46-99152
Int. Cl. F02m 1/10, 3/06; F02p 5/08
U.S. Cl. 123—117 R 4 Claims



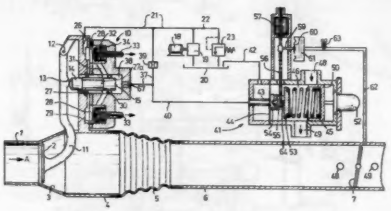
A carburetor control mechanism adapted for minimizing noxious and harmful components in exhaust gases of an automotive gasoline powered internal combustion engine. The carburetor control mechanism comprises a first vacuum responsive actuator which is responsive to vacuum prevailing in an intake manifold of the engine tp automatically open a carburetor throttle valve during the warming-up period of the engine after the engine is started, a solenoid valve for providing communication between the first vacuum responsive actuator and the intake manifold during the warming-up period of the engine, an electric control device for controlling the solenoid valve and for retarding the ignition timing of the engine during the warming-up period, a second vacuum responsive actuator which is responsive to vacuum prevailing in the intake manifold to automatically open a choke valve, and a thermostat controlled device for controlling the level of vacuum acting on the second vacuum responsive actuator in accordance with the engine temperature.

3,791,359

FUEL INJECTION APPARATUS FOR EXTERNALLY IGNITED INTERNAL COMBUSTION ENGINES OPERATING ON CONTINUOUSLY INJECTED FUEL

Konrad Eckert, Stuttgart, and Heinrich Knapp, Leonberg-Silberberg, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 24, 1972, Ser. No. 308,986
Claims priority, application Germany, Nov. 24, 1971, 2158093
Int. Cl. F02m 69/00
U.S. Cl. 123—119 R 4 Claims



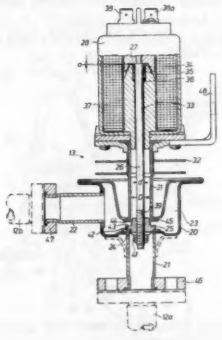
In a fuel injection apparatus the air-fuel ratio is controlled by an air sensor as a function of the air quantities passing through the suction tube. Said ratio is varied by altering a liquid pressure which serves as a return force for the air sensor. The liquid pressure is varied by a valve loaded in the closing direction by a spring, the bias of which is affected, among others, during the warm-up run of the engine, by the pressure that prevails in the suction tube immediately downstream of an arbitrarily operable butterfly valve.

3,791,360

SOLENOID VALVE FOR RECYCLING EXHAUST GASES IN INTERNAL COMBUSTION ENGINES

Franz Rieger, Wasseralfingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 3, 1972, Ser. No. 223,253
Claims priority, application Germany, Feb. 6, 1971, 2105583
Int. Cl. F02m 25/06
U.S. Cl. 123—119 A 6 Claims



In an internal combustion engine including a return conduit connecting the exhaust pipe with the intake manifold to recycle one part of the exhaust gases, there is provided in said

return conduit a solenoid valve which has a housing, a movable valve head for opening and closing said return conduit, an electromagnet held externally spaced from said housing by a spacer tube affixed to said housing and a valve rod passing through said spacer tube and carrying at one end said valve head and being secured, at its other end, to the movable armature of said electromagnet.

3,791,361

RPM REGULATOR FOR A FUEL INJECTION PUMP SERVING AN INTERNAL COMBUSTION ENGINE

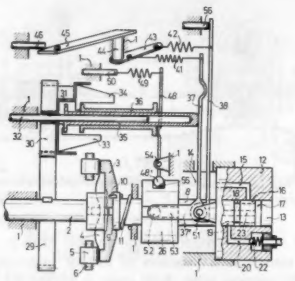
Karl Hofmann, Aldingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 15, 1972, Ser. No. 280,867

Claims priority, application Germany, Sept. 9, 1971, 2145036

Int. Cl. F02m *59/20*

U.S. Cl. 123—139 AP **4 Claims**



In a fuel injection pump associated with an internal combustion engine, the fuel quantities injected during each pressure stroke on the one hand and the injection start on the other hand are separately regulated as a function of the engine-rpm by two groups of centrifugal weights, each group displacing a separate governor member moving independently from the other.

3,791,362

GOVERNOR FOR CONTROLLING THE FUEL DELIVERY OF A FUEL INJECTION PUMP FOR AN INTERNAL COMBUSTION ENGINE

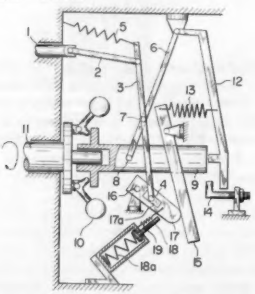
Yoshiatsu Nakamura, Oomiya, and Susumi Odashima, Oyama, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 21, 1972, Ser. No. 317,703

Claims priority, application Japan, Dec. 23, 1971, 46-104891

Int. Cl. F02d *1/04, 1/06*

U.S. Cl. 123—140 R **3 Claims**



A governor for controlling the fuel delivery of a fuel injection pump for an internal combustion engine which has a control rack for controlling the fuel delivery of a fuel injection pump, a link pivotally connected at one end to one end of the control rack, a floating lever pivotally connected at one side thereof to the other end of the link, a start spring fixed at one end thereof to a housing and secured at the other end thereof to one side end of the floating lever, a guide lever pivotally secured at one end thereof to the housing by a first fulcrum and engaged through a first shaft at the intermediate thereof with the intermediate of the floating lever, pivotally mounted centrifugal weights pivotally secured to the drive shaft of the fuel injection pump, a shifter axially slidably engaged with the drive shaft and the centrifugal weights at one end thereof and pivotally secured at the intermediate thereof to the other end of the guide lever, a regulator lever pivotally secured at one end thereof to the first fulcrum and slidably contacted at the other side with the other end of the shifter, a spring secured at one end thereof to the intermediate of the regulator lever, a stopper for stopping the regulator lever at the other end in full load of the fuel injection pump, and a throttle lever secured at one end thereof to the other end of the spring and pivotally secured at the same side thereof to the housing by a second fulcrum and manually operable at the other end thereof, the improvement in the governor having cam means having an axially long hole slidably engaging the other end of the floating lever through a movable fulcrum for controlling the control rack so that the control rack does not move abruptly when the throttle lever is quickly operated, and stopper means contacted with the cam means for stopping the cam means so that the control rack is not pushed to the maximum fuel injection position of the fuel injection pump when the engine is in no load and at minimum speed.

3,791,363

ELECTRONICALLY CONTROLLED REVERSAL-PROOF MAGNETO IGNITION SYSTEM

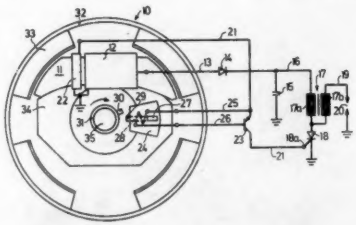
Peter Schmaldienst, and Georg Gemander, both of Nurnberg, Germany, assignors to Robert Rosch GmbH, Gerlingen-Schillerhohe, Germany

Filed Nov. 24, 1972, Ser. No. 309,429

Claims priority, application Germany, Feb. 8, 1972, 2205722

Int. Cl. F02p *1/17*

U.S. Cl. 123—148 E **10 Claims**

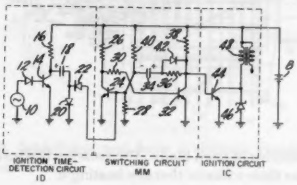


A transistor operating as an AND gate permits a semiconductor controlled rectifier to discharge a condenser through the primary of an ignition coil when the magneto and the motor to which it is coupled are turning in the normal direction but does not allow the SCR to be fired when the motor turns in the other direction. A pulse transmitter is mounted on the armature plate of the magneto so as to provide properly timed pulses in cooperation with a projection revolving on the hub of the device. The disposition of these elements relative to the armature which provides the alternating current to the switching path of the transistor assures the appropriate polarity of the voltages applied to the transistor.

3,791,364
IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Toshikazu Saita, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 26, 1971, Ser. No. 146,934
Claims priority, application Japan, June 3, 1970, 45/54605
Int. Cl. F02p 3/02
U.S. Cl. 123—148 E 4 Claims

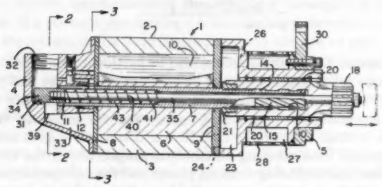


The disclosed ingition system includes a monostable multivibrator passing into its semistable state each time the associated engine is to be ignited to put a normally conducting switching transistor in its nonconducting state. This causes the interruption of a current flowing through an ignition coil to generate an ignition voltage across it. In the monostable multivibrator a capacitor is serially connected to a resistor high in magnitude of resistance to increase a time constant for charging and a semiconductor diode is connected across the resistor to decrease a time constant for discharging.

3,791,365
AIR STARTER

Robert S. Pharr, and Robert H. Broyden, both of Roanoke, Va., assignors to Ingersol-Rand Company, Woodcliff Lake, N.J.

Filed Mar. 20, 1972, Ser. No. 236,026
Int. Cl. F02h 7/08
U.S. Cl. 123—179 F 15 Claims

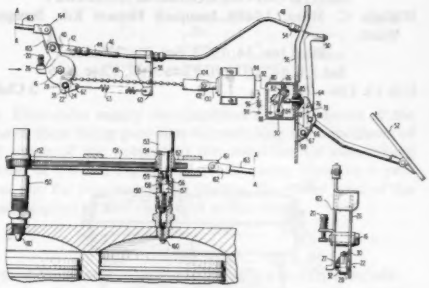


A pneumatically operated starter having a combination piston-valve, located in a first chamber downstream of the usual on-off valve, that throttles the starter to a low speed initially in its closed position and as air is supplied opens in response to the air pressure and simultaneously engages the starter pinion with the engine ring gear and upon further engagement of the starter pinion allows air to freely pass and accelerate the starter. Upon the starting of the engine, the piston-valve is automatically returned to its initial position by a combination of mechanical helical pinion throwout, spring return and latching pressurization of a second chamber behind the piston-valve. Latching pressurization is accomplished by a second valve admitting air pressure behind the piston-valve in response to a pressure signal developed in the starting cycle. The air supply may then be shut off manually to stop the throttled rotation of the starter and to reset the second valve controlling the latching pressurization of the chamber behind the piston-valve to ready the starter for the next starting cycle.

3,791,366
FAIL-SAFE THROTTLE CONTROL

Charles W. MacMillan, 3400 20th St. Ct., Rock Island, Ill.

Continuation-in-part of Ser. Nos. 88,450, Nov. 10, 1970, Pat. No. 3,626,919, and Ser. No. 153,330, June 15, 1971, Pat. No. 3,731,667. This application Dec. 10, 1971, Ser. No. 206,656. The portion of the term of this patent subsequent to Dec. 28, 1988, has been disclaimed.
Int. Cl. F02b 77/08, 11/04; B60k 27/08
U.S. Cl. 123—198 DB 9 Claims

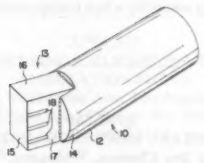


The invention relates to a fail-safe throttle control mechanism which is positioned between an accelerator pedal of a motor vehicle engine incorporating a fuel injection system and includes a linkage assembly which extends from the accelerator pedal to the fuel injection control system and has combined therewith a sensing mechanism for disengaging the accelerator pedal from the fuel injection control system so that the engine of the motor vehicle can instantly return to an idle condition irrespective of any impairment in the control linkage or blockage of the accelerator pedal. There are disclosed various embodiments for achieving this fail-safe operation of fuel injection control mechanisms.

3,791,367
TOOL FOR DRESSING GRINDING WHEELS AND THE LIKE

Rudy J. Cirell, 1100 W. 38th St., Lorain, Ohio, and Nance J. Scardena, RD No. 1, Vermilion Rd., Amherst, Ohio

Filed Jan. 19, 1972, Ser. No. 219,015
Int. Cl. B24b 53/12
U.S. Cl. 125—11 R 1 Claim



A tool for dressing and trueing abrasive grinding wheels. The tool includes a matrix in the shape of a rectangular prism formed of fused powdered metal removably held in a holder, and a plurality of diamond macles imbedded in the matrix. The matrix has a rectangular front face with end edges that en-

gage the grinding wheel, the top face being progressively eroded during the dressing operation. The macles are located with their faces perpendicular to the direction of movement of the grinding wheel surface and with one point thereof at an end edge of the front face of the matrix, so that even though the matrix and macles are eroded during the dressing operation, a diamond point is always maintained at each end edge of the front face.

3,791,368

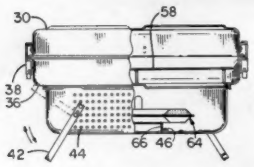
MULTIPURPOSE COOKING ASSEMBLY

William C. Hunt, 15488 Issaquah Hobart Rd., Issaquah, Wash.

Filed Jan. 24, 1972, Ser. No. 220,313

Int. Cl. A47j *37/00;* **F24b** *3/00;* **F24c** *1/16*

U.S. Cl. 126—25 A **3 Claims**



A portable multipurpose cooking assembly for outdoor cooking is used as a stove, griddle, toaster, pressure cooker, and charcoal broiler. It is contained in a single portable small carrying case weighing only a few pounds, inclusive of cooking fuel and accessories. The components are: a top cover and a bottom cover of the small carrying case which also serves as a pressurized cooker or oven; a base with pivotal supporting legs used during all cooking operations as a housing for heating units and support for other components; a solid griddle to provide a cooking surface placed on top of the base during cooking and placed inside the bottom cover when packed away; an open grill placeable either over the base or inside the bottom cover; a briquet carrier placed inside the base to hold charcoal and serve as a charcoal broiler tray; a propane burner assembly removably housed inside the base having a metal tube leading to a propane fuel source outside the base to provide the overall heating unit when cooking; a removable handle attachable to the side of the top cover when carrying the cooking assembly and also attachable to the griddle to easily transport prepared food to the table or other place of serving; and other accessories, such as: a wooden cutting board, insulated mitts, small spears and smoke chips, all placed within the multipurpose cooking assembly when transported.

3,791,369

ROTARY HEAT EXCHANGER

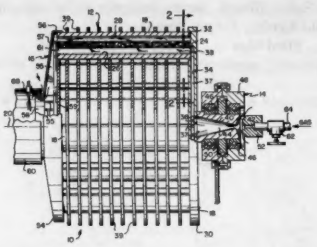
Nicholas Howard Des Champs, Whippany, N.J., assignor to Donbar Development Corporation, New York, N.Y.

Filed Aug. 8, 1972, Ser. No. 278,723

Int. Cl. F24h *3/08*

U.S. Cl. 126—116 R **20 Claims**

A rotary heater including a rotor assembly mounted for rotation about an axis, the assembly having a plurality of parallel hollow blades. Combustible gas is supplied to the interior of the blades where it interacts with a catalytic element fixed therein. As the rotor assembly rotates the gas is raised to the ignition temperature whereupon combustion occurs



within the interior of each blade. The rotating blades draw ambient air over their exterior thereby heating it.

3,791,370

DEVICE FOR COOKING FOODS

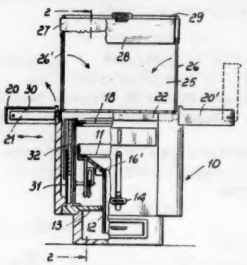
Hans Fauser, Flamatt-Friburg, Switzerland, assignor to Societa'Italiana Superior S.r.L., Milan, Italy

Filed Apr. 7, 1972, Ser. No. 242,011

Claims priority, application Italy, Apr. 13, 1971, 23087A/71

Int. Cl. F24b *3/00*

U.S. Cl. 126—25 A **8 Claims**



A device for cooking foods, and in particular for preparing foods by grilling, spit roasting, oven roasting, and the like provided with a collapsible hood structure for protecting the cooking zone, for evacuating fumes and for ensuring maximum overall efficiency. The device comprises a grill and a collapsible food cooking assembly arranged above the cooking zone and including cooking plates and the collapsible hood structure has not only rear and side walls but also plate members removably arranged between the side walls at the front and the top of the device so as to define a hood space having an outflow opening for the fumes variable in size by displacing the plate members for adjusting the air draught through the device according to the food preparing requirementes.

3,791,371

COOKING OVENS

Gerald Arthur Oatley, Palma Lodge, Mill Ln., Codsall, England

Filed Aug. 8, 1972, Ser. No. 278,825

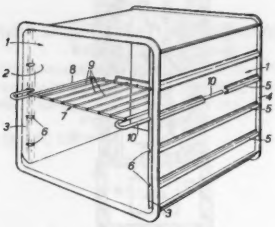
Claims priority, application Great Britain, Aug. 10, 1971, 37,414/71; June 9, 1972, 26,923/72

Int. Cl. F24c *15/16*

U.S. Cl. 126—339 **12 Claims**

The shelf of a domestic cooking oven, instead of resting directly on runners at the side walls of the oven, has outriggers cantilevered from the front corners of the shelf extending rearwards alongside the ends of the shelf and engaging runners hidden behind the side walls of the oven or behind liners

covering the side walls. The runners may be on the side walls or on the liners and the liners may have a heat-clean finish or



be readily detachable and have a vitreous enamel or other easily cleaned finish.

3,791,372

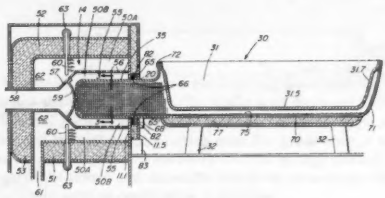
HEAT PIPE COOKING APPLIANCE

George N. Hatsopoulos; Lazaros J. Lazaridis, both of Lincoln, and Edward F. Searight, Harvard, all of Mass., assignors to Thermo Electron Corporation, Waltham, Mass.

Filed July 12, 1972, Ser. No. 270,932

Int. Cl. A47j *27/24*

U.S. Cl. 126—390 **11 Claims**



Cooking utensils incorporating heat-pipe heat transfer units in a unitary hand-portable structure are constructed in the form of a pot or a pan having a heat-receiving member extending therefrom and a food heating zone in the pot or pan. Each utensil has a sealed enclosure containing a working fluid which in operation is vaporized in the heat receiving zone and condenses under the pan to yield heat of vaporization for cooking purposes. A cooking station has a table or counter top that is clear, and a back-wall supporting one or more heat-sources behind apertures provided for passage of the projecting heat-receiving members of the utensils therethrough into thermal-transfer relation with the heat sources. A utensil is engaged with a heat source by resting it on the counter top and pushing its projecting heat-receiving member through the back wall into engagement with a heat source, and is taken out of use by simply pulling it away from the back wall. The utensils are completely sealed and may be handled and cleaned like ordinary pots and pans. Thermal monitoring may be done by sensing temperature at the heat receiving member of a utensil outside the heat source being used.

3,791,373

PORTABLE ELECTROANESTHESIA DEVICE WITH AUTOMATIC POWER CONTROL

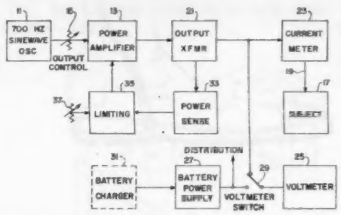
Edward R. Winkler, Carbondale, and Edward J. McGowan, Jr., Villa Park, both of Ill., assignors to Southern Illinois University Foundation, Carbondale, Ill.

Filed Mar. 2, 1972, Ser. No. 231,161

Int. Cl. A61n *1/34*

U.S. Cl. 128—1 C **7 Claims**

A portable, battery-powered, self-contained electroanesthesia device. A signal generator provides a sinusoidal, constant magnitude signal of fixed, preset frequency with relatively high accuracy and without recalibration each time the device is energized. The preset frequency characteristically produces electroanesthetic induction in a live subject with relatively high efficiency. An amplifier increases the power level sufficiently for producing electroanesthetic induction of the sub-



ject. Electrodes supply the amplified signal to tissue of the subject, there being provision for matching the impedance of said tissue of the subject to the amplifier for maximizing transfer of the amplified signal to said tissue. Circuitry is provided also for monitoring and limiting the power level of the signal supplied by said electrodes to the tissue.

3,791,374

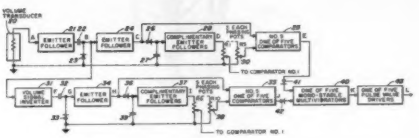
PROGRAMMER FOR SEGMENTED BALLOON PUMP

Henry R. Guarino, Revere, Mass., assignor to The United States of America as represented by the Secretary, Department of Health, Education and Welfare, Washington, D.C.

Filed Aug. 9, 1971, Ser. No. 169,936

Int. Cl. A61m *1/00*

U.S. Cl. 128—1 D **5 Claims**



A circuit for programming the inflation and deflation of a five segmented balloon pump as used in circulatory assist blood pump systems is disclosed. The rising and falling edges of wave pulses are used by a volume transducer to create a volume signal corresponding thereto. Means are provided to produce a plurality of signals corresponding to the rising edge of the waveform and a plurality of signals corresponding to the falling edge thereof. These signals are used to activate the various valves of the balloon pump and thereby inflate and deflate the segments.

3,791,375

DEVICE FOR SENSING AND WARNING OF EXCESSIVE AMBULATION FORCE

Erich A. Pfeiffer, 8730 Orion Ave., Los Angeles, Calif.

Filed Sept. 29, 1971, Ser. No. 184,662

Int. Cl. A61b *5/10*

U.S. Cl. 128—2 S **10 Claims**

Warning of excessive ambulation force, for limiting the application of weight on a lower extremity, usually in the recovery from orthopedic surgery of the lower extremity, is accomplished by a fluid-containing load cell which deflects and changes its volume in accordance with the amount of load thereon. A tubular connector connects the load cell fluid with a displacement-measuring device, for example, a bellows. A particular displacement limit, conveniently signaled with an

electrical alarm indicates when predetermined load on the cell is reached.

The United States Government is licensed under this patent to make, use or sell this invention for Government purposes.

3,791,376

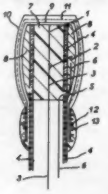
MICROSONDE FOR CATHETER USE, FOR THE CONTINUOUS MEASUREMENT OF PARTIAL OXYGEN PRESSURE

Boris Rybak, 35, Avenue du 6 Juin, Caen, Calvados, France

Filed Dec. 14, 1970, Ser. No. 97,948

Int. Cl. A61b *5/00*

U.S. Cl. 128—2 E **7 Claims**



Microsonde for catheter use, operating under the principle of oxygen polarography, namely intended for continuous and instantaneous determination of oxygen partial pressure in blood vessels. The measurement head of said sonde has a diameter of 0.6 mm, comprises a platinum wire as a cathode and a paste containing powdered silver as anode. The head is covered with a first membrane of collodion against said anode, an electrolyte-impregnated support and a selectively gas-permeable thin membrane.

3,791,377

RADIO CAPSULE BATTERY

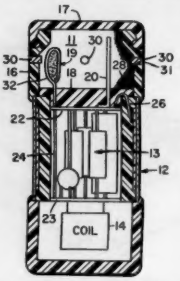
Thomas E. Norby, 3617 Allendale Dr., and Charles H. Rogers, 3724 Arrowhead Dr., both of Raleigh, N.C.

Filed June 30, 1971, Ser. No. 158,294

Int. Cl. A61b *5/07*

U.S. Cl. 128—2 P **14 Claims**

A battery for an active radio capsule wherein one of the electrodes, a silver-silver chloride electrode, functions as the reference electrode for a sensor by means of an electrolytic path from the battery chamber to the solution external to the capsule. The reference electrode, which is stable and insensitive to foreign ions, is disposed in a closed chamber filled with an electrolyte which is immobilized by an absorptive powder. One or more fibrous plugs form an electrical connection between the chamber and the surrounding medium. The



reference electrode is designed to have a low, stable internal impedance and has a high current capability.

3,791,378

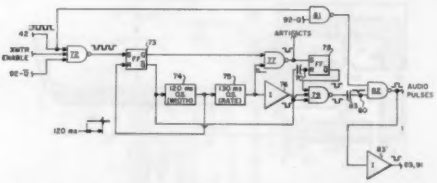
BLOOD PRESSURE MONITOR WITH RATE SENSING ARTIFACT REJECTION PROCESSING CIRCUITRY

Howard Martin Hochberg, E. Windsor, and Harold Lee Massie, Hightstown, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 1, 1971, Ser. No. 130,148

Int. Cl. A61b *5/02*

U.S. Cl. 128—2.05 M **5 Claims**



Apparatus for automatically implementing indirect blood pressure measurement with transducer means for deriving and developing electrical signals in response to the interaction of blood pressure and cuff pressure under a varying external pressure capable of occluding an artery, detector means for analyzing the electrical signals in terms of pulse rate for detection and rejection of artifact signals, and means for evaluating artifact signals in terms of their number and duration to provide an alarm indication when artifacts become significant.

3,791,379

VALVE FOR ENDOSCOPES

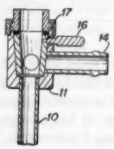
Karl Storz, Hermannstrasse 14, Tuttlingen, Germany

Filed Sept. 2, 1971, Ser. No. 177,350

Claims priority, application Germany, Mar. 2, 1971, G 71 07 645.4

Int. Cl. A61b *1/12, 17/32;* **F16k** *11/02*

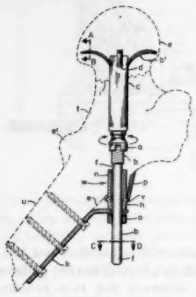
U.S. Cl. 128—4 **5 Claims**



Endoscopes having a shaft and a head at the proximal end. The head has ducts connected to a source and drain of fluid for irrigating the body and a valve member located in the head

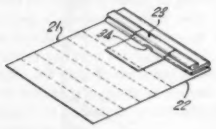
rotatable between a first position permitting entry of the fluid and a second position allowing removal of the fluid.

3,791,380
METHOD AND APPARATUS OF IMMOBILIZING A FRACTURED FEMUR
Gerhard Dawidowski, Schutzenstrasse 15, Bad Tolz, Germany
Continuation-in-part of Ser. No. 883,255, April 13, 1970, abandoned. This application Dec. 13, 1971, Ser. No. 207,594
Int. Cl. A61f 5/04
U.S. Cl. 128—92 BB 9 Claims



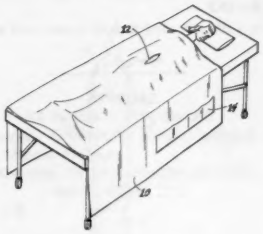
The invention relates to a method and apparatus for immobilizing the fractured neck of a femur with the head portion of the femur by first aligning the head and neck through a guide wire and thereafter telescoping over the guide wire, a tubular body containing means for entry into the spongy portion of the head of the femur and thereafter applying pressure to the neck of a femur until re-ossification is attained.

3,791,381
UNIVERSAL SURGICAL DRAPE
Henrietta K. Krzewinski, Old Bridge, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.
Filed Sept. 29, 1971, Ser. No. 184,737
Int. Cl. A61f 13/00; A61b 19/06
U.S. Cl. 128—132 D 7 Claims



There is disclosed a multipurpose surgical drape that has utility in different types of surgical procedures. The drape is composed of a nonwoven fabric and has on its upper surface adjacent one edge a reinforced panel having an absorbent surface and an impervious film between the absorbent surface and the main body of the drape. The drape is folded in such a manner that that portion of the drape having the reinforced panel may be cut to form functional drapes for different surgical procedures.

3,791,382
WATERPROOF BODY COVERINGS WITH FLUID RECEIVING POCKETS
Robert F. Collins, Barrington, Ill., assignor to The Kendall Company, Walpole, Mass.
Continuation-in-part of Ser. No. 37,637, May 15, 1970, abandoned. This application Apr. 4, 1972, Ser. No. 240,914
Int. Cl. A61f 13/00, 13/18; A61l 15/00
U.S. Cl. 128—132 D 30 Claims



A surgical drape having a main sheet for placement on a patient's body for performing a surgical procedure. The drape has at least one pocket on the outer surface of the main sheet to receive fluid runoff from the site of surgical procedure.

3,791,383
ANIMAL SHIELD
Sanford J. Friedman, 15260 Kenton, Oak Park, Mich.
Filed Dec. 23, 1971, Ser. No. 211,529
Int. Cl. A61f 13/00
U.S. Cl. 128—154 6 Claims

A shield for enveloping a leg-sustained injury on four-legged animals includes a tubular member having cut-out sections and harnessing means such that the movement of the animal is unimpaired.

3,791,384
ARTIFICIAL INSEMINATION OF SOWS
Ludwig Richter, Trappenkamp, and Albert Liedicke, Wahlstedt, both of Germany, assignors to H. Wilhelm Schaumann, Hamburg, Germany
Filed May 11, 1972, Ser. No. 252,272
Claims priority, application Germany, July 15, 1971, 2135318; Oct. 30, 1971, 2154260
Int. Cl. A61d 7/02
U.S. Cl. 128—260 13 Claims

A method of preserving boar sperm by deep-freezing thawing and introduction into the uterus of the sow, in which method the ejaculate after being collected is centrifuged, and the sediment is diluted, frozen to a temperature of −180° to −200°C, at the time of use is thawed by being placed in such a quantity of diluent warmed to 40° to 50° C that a dilution of the sperm which is appropriate for effective bathing of the uterus is achieved, and the diluted fluid is introduced into the uterus. The ejaculate is inactivated after being collected and before being centrifuged, and after being thawed the sperm

solution has added to it a solution which mobilizes the spermatozoa.

3,791,385

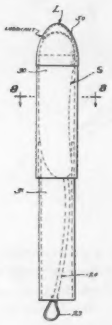
CATAMENIAL DEVICE AND APPLICATOR THEREOF

Alwyn K. Davis, 483 Massey St., Thousand Oaks, Calif., and Ward A. St. John, 58 Farland Dr., Newbury Park, Calif.

Filed Oct. 16, 1972, Ser. No. 297,881

Int. Cl. A61f *13/20*

U.S. Cl. 128—263 **39 Claims**



An expendible menses collector for insertion into the vagina and comprised of a collapsible monocoque shell of ovular form having a perforated upper hemisphere and an imperforate lower hemisphere and within which there is a chamber filled with resilient and absorbent material. The shell of the device is pliant and supple and has a circumferential seal at its major diameter that effectively engages with the vagina wall. Insertion is effected by collapse of the pliant shell and aided by lubrication released from a frangible or water soluable cell, and is implemented by a cylinder and piston applicator.

3,791,386

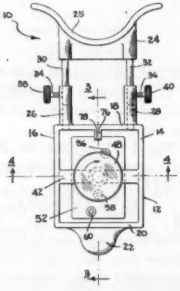
TRACHEOTOMY METHOD AND MEANS

Bernard McDonald, Malibu, Calif., assignor to McDonald Medical Laboratories and Instrument Company, Huntington Park, Calif.

Filed Sept. 27, 1971, Ser. No. 184,030

Int. Cl. A61b *17/32*; **A61m** *16/00, 25/00*

U.S. Cl. 128—305 **11 Claims**



A device and technique are disclosed for enabling a tracheotomy to be performed by those lacking medical training or skills, and under emergency conditions. An indexing frame with chinrest is secured to the patient's neck, and rotation of a knob on the frame causes three hollow air tubes to penetrate the windpipe. The frame is thereafter removed, leaving the tubes in place for attachment of oxygen hoses.

3,791,387

FORCEPS

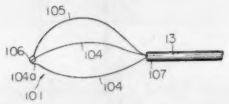
Mitsuto Itoh, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Division of Ser. No. 203,633, Dec. 1, 1971, Pat. No. 3,739,784. This application Mar. 5, 1973, Ser. No. 338,174

Claims priority, application Japan, Dec. 5, 1970, 45/107833; Dec. 5, 1970, 45/107834

Int. Cl. A01b *1/06, 17/00, 1/72*

U.S. Cl. 128—320 **4 Claims**



A forceps for use with an endoscope has a first or cutting wire which extends in a loop from the distal end of the flexible endoscope tube, whereas the two proximal ends may be shifted in the tube by means of a control mechanism on the proximal tube end so as to expand and contract the loop. A second wire has a distal end pivotally attached to the loop, while its main portion passes through the endoscope tube to a control device at the proximal end of the tube which permits the second wire to be shifted longitudinally in the tube, and thereby to be bulged out from the loop for receiving a polyp or the like, and to be tightened about the severed polyp for safely retracting the severed piece together with the forceps.

3,791,388

COVERED SUTURE

Alastair Wilson Hunter, Somerville, and Neil Howard Rosen, Willingboro, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

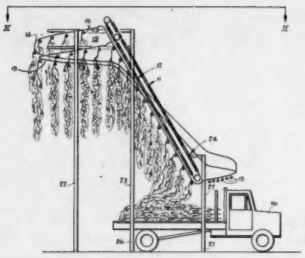
Filed Sept. 22, 1971, Ser. No. 182,792

Int. Cl. A61l *17/00*

U.S. Cl. 128—335.5 **10 Claims**

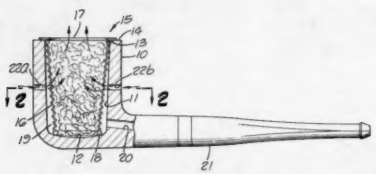
Surgical sutures having an improved knot strength are constructed with a central core of multifilament yarn that has been impregnated with an adhesive binder. The adhesive binder coated core yarn is covered with a ribbon-like helical winding of multifilament yarn and the composite structure is hot stretched whereby the binder secures the external winding to itself and the central core.

3,791,389
MECHANICAL VINE TRANSFER AND CARRIER
Florian F. Dauenhauer, 111-121 Fifth St., Santa Rosa, Calif.
Filed Oct. 16, 1972, Ser. No. 297,896
Int. Cl. A01g *19/00*
U.S. Cl. 130—30 D 14 Claims



Mechanically operable means for automatically transferring hanging hop vines from at rest positions at a station in an upright hop picking machine into the jaws of vine grippers on moving vine carriers which transport the hanging vines through the hop picking unit of the machine.

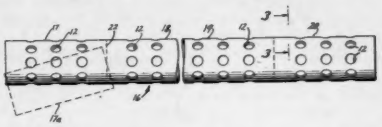
3,791,390
SMOKING PIPE
Victor P. Hendricks, 1776 Wright St., Pomona, Calif.
Filed Aug. 14, 1972, Ser. No. 280,505
Int. Cl. A24f *1/22*, *1/18*
U.S. Cl. 131—196 4 Claims



A smoking pipe having a foraminous bowl insert which serves as a grate for the burning tobacco, the insert coacting with the inner wall of the bowl cavity to provide a surrounding air chamber having a communication with a smoking stem passage, and an auxiliary passage between the air chamber and the bowl exterior adapted for finger control by the smoker so as to be closable during conventional smoking, and opened for short inactive smoking periods to provide combustion air to the air chamber to maintain combustion and continued burning of the tobacco.

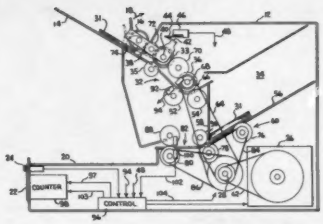
3,791,391
HAIR CURLER APPARATUS
Zodell W. Prince, P.O. Box 94111, Houston, Tex.; Dallas D. Weatherholt, 13207 Buxley, Houston, Tex., and Adelene Trombatore Reistino, 1002 San Jose, Hearne, Tex.
Continuation-in-part of Ser. No. 66,217, Aug. 24, 1970, abandoned. This application June 20, 1972, Ser. No. 264,444
Int. Cl. A45d *2/02*
U.S. Cl. 132—39 5 Claims

Disposable hair curlers, made of plastic-coated paper, and intended to be disposed of after only one use. In a preferred embodiment, the curlers are supplied plurally in stick form,



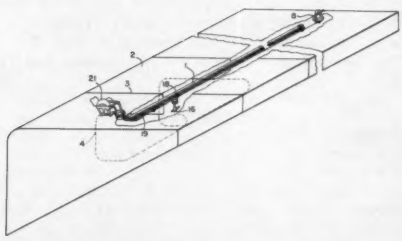
one curler at a time being broken from the stick of curlers for use.

3,791,392
CURRENCY DISPENSER
Walter J. Hanson, Greenwich, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.
Filed Sept. 28, 1972, Ser. No. 292,921
Int. Cl. G06m *7/06*
U.S. Cl. 133—1 R 1 Claim



A paper currency dispenser is described for rapidly dispensing a number of notes or bills. The dispenser has an automatic in-feed as well as an automatic out-feed drive with bill detectors suitably located to sense the passage of separated bills. Signals from the detectors may be used to update a counter to indicate how many bills are stored or have been dispensed or to dispense a specific quantity demanded by an operator. The dispenser employs modularized units which dispense bills of different denominations and are driven by a common motor. A practical structure with rapidly acting belt driving elements is obtained to dispense bills successively and controllably at high speeds.

3,791,393
TANK CLEANING APPARATUS
David John Baldwin, London, England, assignor to Sybron Corporation, Rochester, N.Y.
Filed Mar. 6, 1972, Ser. No. 232,073
Int. Cl. B08b *3/02*, *9/08*
U.S. Cl. 134—167 R 8 Claims



Device for cleaning the interior of elongated tanks or tanks where access to the interior is limited consisting of a tank

cleaning machine attached to a source of cleaning liquid. The tank cleaning machine is movably affixed to a track and drives along the track during the cleaning operation, the track extending through the area of the tank to be cleaned so that the cleaning operation extends to portions of tank interior where access from the outside is limited. An externally mounted gas tight winch is preferred as the drive means. A flexible hose provides connection between the tank cleaning machine and the source of cleaning liquid and the hose may be calibrated so that the position of the tank cleaning machine within the tank can be determined. Entry to the tank interior for mounting and dismounting the tank cleaning machine on the track is through an entry port located adjacent one end of the track.

3,791,394

APPARATUS FOR CLEANING VESSELS HAVING AN INLET

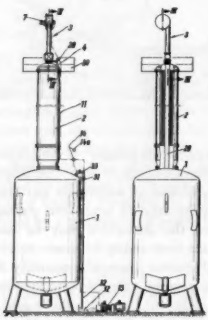
Paul Hammelmann, Zum Sunderm 17, Oelde/Westfalen, Germany

Filed Aug. 22, 1972, Ser. No. 282,626

Claims priority, application Germany, Aug. 27, 1971, 2142978

Int. Cl. B08b *9/08*

U.S. Cl. 134—167 R **9 Claims**



A housing has an outlet and can be mounted on a vessel so that the outlet communicates with the inlet opening of the vessel. The housing accommodates a reel on which a hose is mounted and the hose carries one or more hydrodynamic cleaning devices which can be lowered into and withdrawn out of the vessel by turning of the reel. A valve can close the outlet when the cleaning device is not to be used.

3,791,395

RESTARTING FLOW OF GELLED OIL

Henry F. Dunlap, and Ralph E. Styring, Jr., both of Dallas, Tex., assignors to Atlantic Richfield Company, New York, N.Y.

Filed Dec. 15, 1972, Ser. No. 315,687

Int. Cl. F17d *1/10*

U.S. Cl. 137—13 **20 Claims**

The startup yield pressure of a segment of standing oil which has cooled below its pour point is reduced by applying reoccurring pressure pulses or cycles to the gelled oil at a pressure such that portions of the gelled oil are progressively shear degraded. The pressure pulses are continued until the flow resistance of the gelled oil has been degraded enough to enable renewal of oil flow at a higher continuous startup pump flow rate for a given pressure than could otherwise be obtained.

3,791,396

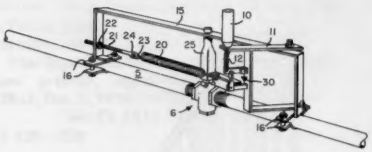
VALVE SHUTOFF DEVICE

Wesley C. Nelson, 698 S. 8th St., No. 2, San Jose, Calif.

Filed Sept. 15, 1972, Ser. No. 289,758

Int. Cl. F16k *17/36*

U.S. Cl. 137—38 **6 Claims**



A device for shutting off a valve in a supply line carrying combustible gas or liquid which is actuated when subjected to the influence of significant earth tremors or vibratory exitation. A valve stem extension is connected with the stem of an existing valve. The valve stem extension has a lever arm which is normally held in a position at which the connected valve is open. The lever arm is spring biased in a direction in which the lever would travel if the valve were closed; the bias is created by a spring positioned between said lever and one side of a frame attached to said supply line. A latch holds the lever arm in the normal position until and unless the device is subjected to significant earth tremors or vibratory excitation. Under the influence of significant earth tremors or vibratory excitation a weight, balanced on the other side of said frame, will topple, thereby pulling a chain attached to the latch and opening the latch. The spring bias causes the lever arm to move so the valve stem extension and valve stem turn to close the valve.

3,791,397

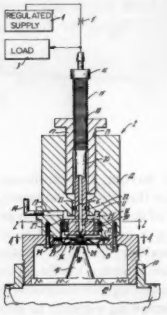
DIAPHRAGM PRESSURE SENSOR

George J. Janu, Milwaukee, Wis., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Aug. 30, 1972, Ser. No. 284,725

Int. Cl. F15b *5/00*; **G05d** *16/00*

U.S. Cl. 137—82 **12 Claims**

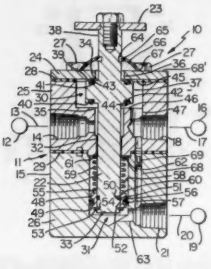


A pressure sensor includes a diaphragm mounted in relatively fixed relationship with respect to an orifice unit interconnected to the end of a threaded pipe. A threaded adjustment nut is provided with an internal thread to receive the pipe member and includes an outer threaded portion which is threaded into a housing. The inner and outer threads of the adjustment nut are of a very slightly different pitch. The threaded pipe is mounted to prevent rotation of the threaded support member while permitting axial movement thereof. Rotation of the adjustment nut results in axial displacement of the threaded pipe and orifice unit with respect to the diaphragm.

3,791,398
VALVE CONSTRUCTION AND CONTROL SYSTEM UTILIZING THE SAME

Arthur V. Vickery, Manzville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 6, 1972, Ser. No. 304,361
Int. Cl. F16k 17/00
U.S. Cl. 137—625.66 12 Claims

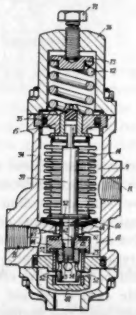


A valve construction having a housing provided with a pair of chambers therein. The housing has first and second valve seats respectively leading to one of the chambers. A valve member is movably carried by the housing and has a pair of valve means for respectively cooperating with the first and second valve seats in an alternate manner. The valve member has a piston part thereof slideably disposed in the other of the chambers and cooperating therewith as a piston in a cylinder whereby fluid pressure in the chamber is adapted to act on one side of the piston part and tend to move the valve member from a position thereof closing one of the valve seats to a position thereof closing the other of the valve seats.

3,791,399
PRESSURE REGULATORS FOR COMPRESSED-AIR CIRCUITS

Jean Gachot, 179 Avenue de la Division Leclerc, Enghien-les-Bains, France

Filed Mar. 7, 1972, Ser. No. 232,538
Claims priority, application France, Mar. 16, 1971, 71.09088
Int. Cl. F16k 31/36
U.S. Cl. 137—116 1 Claim

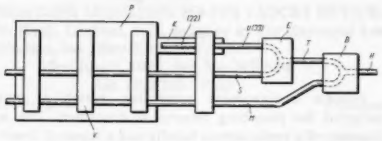


The invention relates to improvements in a pressure regulator for a compressed air circuit. The regulator comprises a measuring chamber connected to the circuit and containing a pressure sensing element, and a regulating chamber connected to a compressor and having an orifice for admission to the measuring chamber, a discharge orifice and an obturator actuated by the pressure sensing element and adapted to open or shut off the discharge orifice according to whether the circuit pressure is higher or lower than predetermined values. According to the invention the regulator comprises a resilient check-valve capable of being applied against the admission orifice to the measuring chamber to prevent backflow of air during the displacement of the obturator.

3,791,400
METHOD AND ARRANGEMENT FOR SEGMENTATION OF A STREAM OF A LIQUID MEDIUM CONVEYED BY A PERISTALTIC PUMP

Jiri Hrdina, Prague, Czechoslovakia, assignor to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Feb. 18, 1972, Ser. No. 227,382
Claims priority, application Czechoslovakia, Feb. 22, 1971, 1309/71
Int. Cl. F02b 43/12
U.S. Cl. 137—154 9 Claims

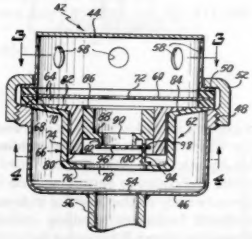


A programmed discharge of a liquid medium conveyed by a peristaltic pump and segmented by segmentation pistons of a segmentation medium introduced into the stream of this liquid medium is achieved by connection of a blinded hose filled with auxiliary medium to the tubing conveying the segmentation medium, with means for periodically compressing and releasing said blinded hose, thus periodically increasing and decreasing the pressure of the segmentation medium according to a preselected programm.

3,791,401
VENTED SANITARY TRAP UNIT

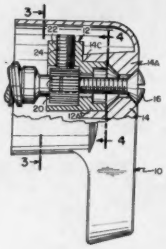
John P. Gorman, Simi Valley, Calif., assignor to Cast Iron Soil Pipe Institute, Washington, D.C.

Filed June 14, 1971, Ser. No. 152,560
Int. Cl. F16k 45/00
U.S. Cl. 137—216.2 9 Claims



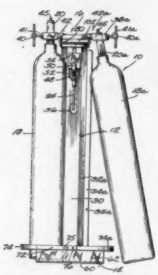
A trap unit for installation into a sanitary drainage system, including a generally U-shaped trap body having a vent element mounted on the inlet leg. The vent element has a check valve to prevent overflows, and the trap unit functions to prevent self siphonage of its liquid seal.

3,791,402
HANDLE REPLACEMENT APPARATUS
James F. Shuler, Grand Rapids, Mich., assignor to Park Electrochemical Corp., Great Neck, N.Y.
Filed Oct. 24, 1972, Ser. No. 300,210
Int. Cl. F16k *43/00*
U.S. Cl. 137—315 7 Claims



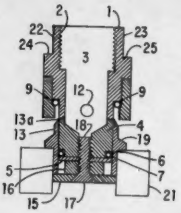
Handle replacement apparatus which is particularly adapted for plumbing fixtures is described. The apparatus consists of a replacement handle and a separate insert. The insert fits onto a valve stem and is locked in place at three points. The handle fits onto the insert.

3,791,403
GAS CYLINDER HOLDER
Ilden R. Folkerth, Sparta, Mich., assignor to Michigan Instruments Inc., Grand Rapids, Mich.
Filed Aug. 3, 1972, Ser. No. 277,683
Int. Cl. F16l *5/00*
U.S. Cl. 137—343 13 Claims



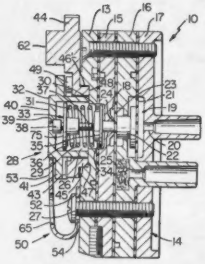
A support column includes a base at one end and a yoke assembly at the other for receiving and holding a pair of gas cylinders side-by-side. The base includes two pockets which open in opposite directions to permit rotation of the bottom of each cylinder outwardly of the base for independent removal. The pocket depth facilitates handling cylinders of varying lengths, and a spring clamp is provided for each bottle to hold it in the base. The support column includes a hose receiving cavity and openings for quick extension and removal of the hose. In addition, openings in the support column permit quick and easy mounting to a special mating support bracket fixture, the latter having guides for indexing the support column relative to the bracket.

3,791,404
FLOAT VALVE
Elbert M. Stevens, 1000 N. Alamo St., San Antonio, Tex.
Filed Apr. 27, 1972, Ser. No. 248,258
Int. Cl. F16k *31/22*
U.S. Cl. 137—433 6 Claims



A float-controlled valve for maintenance of liquid levels in tanks without sensitivity to the supply pressure. It includes an apertured, inner-tube for connection to the liquid supply and a float-actuated, outer-skirt closing flow by closing against gaskets on longitudinally-opposite sides of the apertures and opening flow by motion away from one of the gaskets.

3,791,405
PRESSURE REGULATOR CONSTRUCTION AND METHOD OF MAKING THE SAME
Harold G. Brakebill; Jay L. Lewis, both of Concord, and Walter J. Berleyoung, Knoxville, all of Tenn., assignors to Robertshaw Controls Company, Richmond, Va.
Filed Nov. 20, 1972, Ser. No. 308,118
Int. Cl. F16k *17/04*
U.S. Cl. 137—494 15 Claims



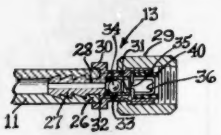
A pressure regulator construction having a housing provided with a control chamber interconnected to an exhaust chamber by a valve seat controlled by a movable valve member. A compression spring acts on the valve member to tend to move the valve member in one direction relative to the valve seat. A spring retainer is movably carried by the housing and has the other end of the spring effectively acting against the same. A movable cam is carried by the housing and is operatively associated with the spring retainer to adjust the same relative to the housing and thus vary the force of the spring whereby the set point of the pressure regulator construction can be selectively set. A mounting arrangement is provided and includes a single fastening member securing the spring retainer and the cam to the housing while permitting movement therebetween.

3,791,406

CHARGING HOSE ASSEMBLY

Virgil J. Philipps, Chicago, Ill., assignor to Everco Industries Inc., Chicago, Ill.

Filed Sept. 8, 1972, Ser. No. 287,289
Int. Cl. F16k *15/04*
U.S. Cl. 137—515.5 3 Claims



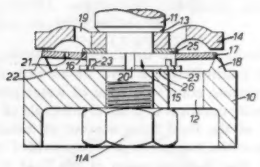
A charging hose assembly including a ball check valve mechanism disposed within the passageway of an end connector for the hose assembly to prevent pressurized reverse flow of material therethrough.

3,791,407

FLUID FLOW CONTROL VALVES

Lawrence George Nicholls, Tyseley, England, assignor to Girling Limited, Birmingham, England

Filed Sept. 8, 1971, Ser. No. 178,767
Claims priority, application Great Britain, Sept. 8, 1970, 42921/70
Int. Cl. F16k *17/26*
U.S. Cl. 137—512.15 4 Claims



A control valve for use in a shock absorber or the like and including a flexible annular valve element engaging inner and outer valve seats; a unitary valve guide and stop is provided having ducts therethrough, the guide being capable of being moulded of inexpensive plastic material thereby eliminating expensive machining, the inner valve seat being an annular member engaging one end of the guide but being entirely separate therefrom.

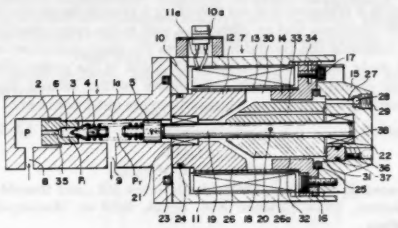
3,791,408

ELECTROMAGNETIC PRESSURE-TELECONTROLLING VALVE

Kouji Saitou, Yokosuka, and Hisakazu Ichioka, Yokohama, both of Japan, assignors to Yuken Kogyo Company Limited, Kanagawa-ken, Japan

Filed May 31, 1972, Ser. No. 258,400
Int. Cl. F16k *17/06*
U.S. Cl. 137—529 6 Claims

This invention provides an electromagnetic pressure-telecontrolling valve characterized in that the valve inserted in a valve port is pressed by a pressure-controlling spring in the influence of a solenoid applied with a current, and that the



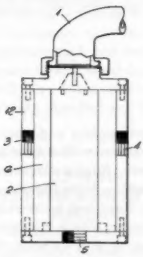
hollow interior of said solenoid is filled with a damping oil so as to give a damping effect to an induced iron core.

3,791,409

TEMPERATURE ADJUSTING WATER FAUCET DEVICE

James M. Rush, Laurens, S.C., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed July 7, 1972, Ser. No. 269,514
Int. Cl. F16k *19/00*
U.S. Cl. 137—597 6 Claims



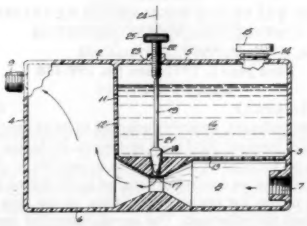
A swivel spout provides water at different water temperatures solely in accordance with the position of the swivel spout. A cylindrical rotary valve has an axially rotatable inner core affixed to and rotatable with the spout for directing water from hot and cold water conduits through the spout.

3,791,410

LIQUID MIXING DEVICE

John Sapiano, Warren, Mich., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed July 14, 1972, Ser. No. 271,750
Int. Cl. F16k *19/00*
U.S. Cl. 137—604 3 Claims



An outer container has an inlet in one wall for admitting a first liquid into the outer container under pressure and an out-

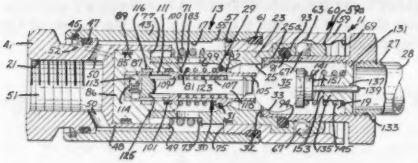
let in another wall for releasing liquid from the outer container. An inner container formed in the outer container has some walls in common with walls of the outer container and some walls in the outer container. The inner container has an inlet in a common wall for admitting a second liquid into the inner container and an outlet in a wall in the outer container for releasing the second liquid from the inner container into the outer container. A regulatable valve in the outlet of the inner container controls the volume of the second liquid released from the inner container into the outer container.

3,791,411

HYDRAULIC COUPLER

Bernard E. Bogeskov, 1895 Meadowview Rd., and Ronald D. Boyum, 9524 Pleasant Ave. South, both of Minneapolis, Minn.

Filed Aug. 18, 1972, Ser. No. 281,930
Int. Cl. F16l *29/00, 37/28*
U.S. Cl. 137—614.02 **11 Claims**



A female coupler for coupling and uncoupling a source of hydraulic fluid under pressure with a male coupler which leads to an implement to receive fluid is disclosed. The female coupler has a main body with a bore therein adapted to receive the source of hydraulic fluid and a cartridge assembly which includes a housing, a sleeve which is movable interior of and with respect to the housing, and a check valve. The cartridge assembly is attachable to the body bore. The sleeve and housing are biased with respect to each other to a normal position and they have a detent ball mechanism cooperating with them so that a male coupler can be insertably held within the sleeve by pushing the male coupler inwardly under force, and the male coupler can be uncoupled by pulling the male coupler out of the sleeve with force. The sleeve has a bore with a seat therein which cooperates with the check valve which is urged within the bore to a position against the seat for blocking flow. The check valve is movable away from the seat for allowing flow. The check valve contains a detent ball mechanism for locking the check valve with respect to the sleeve in a position away from the seat during normal operational flow of the female coupler.

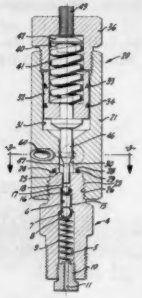
3,791,412

REDUCING VALVE FOR HIGH PRESSURE FLUIDS AND CONNECTING MEANS THEREFOR

Hal N. Mays, 23 Manor Veiw, Fairfax, Calif.

Filed June 5, 1972, Ser. No. 259,438
Int. Cl. F16k *17/06*
U.S. Cl. 137—614.11 **6 Claims**

A pressure reducing assembly adapted to be connected to a source of high pressure fluid such as oxygen, including a fitting adapted to be secured to such source to provide a discharge means and a pressure controller secured to the fitting and provided with means for opening the fitting to the flow of high pressure fluid therethrough. The novel controller and fitting are sufficiently simple and inexpensive to manufacture that, when used with a high pressure oxygen cylinder for example, the entire assembly or the fitting may be economically discarded with the cylinder if the latter is not to be refilled. The high pressure fitting is provided with a valve which is



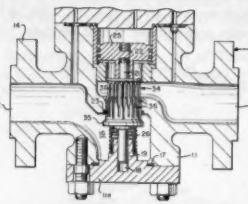
adapted to be opened by the controller when low pressure throttled fluid is withdrawn from the latter.

3,791,413

PRESSURE REDUCING VALVE SPOOL

John T. Muller, Morris Plains, and James H. Cooper, Glen Rock, both of N.J., assignors to Leslie Co., Parsippany, N.J.

Continuation of Ser. No. 150,807, June 7, 1971, abandoned, which is a continuation of Ser. No. 829,612, June 2, 1969, abandoned. This application Mar. 23, 1972, Ser. No. 237,565
Int. Cl. F16k *1/08, 31/12*
U.S. Cl. 137—625.3 **4 Claims**



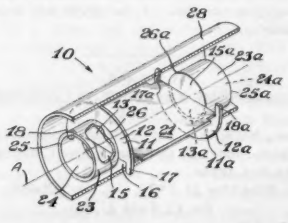
Several embodiments are disclosed of various spool configurations for controlling the flow of an expandable fluid from a high pressure zone to a zone of lesser pressure. The spools structurally conform to a novel principle of controlling the expansion of the fluid from a point of initial throttling throughout the entire expansion profile provided by the valve in such a way that overexpansion of the fluid at any given point is substantially reduced or entirely eliminated.

3,791,414

FLOW INVERTER

Joginder N. Anand, Midland, and Arthur F. Roche, Freeland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 23, 1971, Ser. No. 211,415
Int. Cl. F15d *1/02, 1/06*
U.S. Cl. 138—37 **7 Claims**



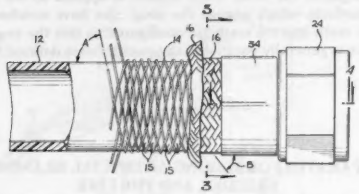
A flow inverter is provided which is readily prepared from sheet- or plate-like elements.

3,791,415

RESILIENT FLEXIBLE HOSE

Glen D. Lawless, Fountain Valley, and Leonard E. Ullrich, Fullerton, both of Calif., assignors to Hydraflow Supply, Inc., Los Angeles, Calif.

Filed May 15, 1972, Ser. No. 253,295
Int. Cl. F16l *11/00*
U.S. Cl. 138—127 7 Claims



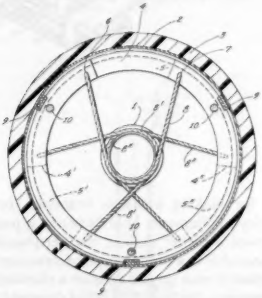
A longitudinally resilient flexible hose having an inner elastomeric tube wrapped on its exterior with an open wire braid at a pitch of approximately 70°, which wire braid is in turn sheathed with a sheath of fiber yarn braided at a pitch of approximately 55°.

3,791,416

SPACER ASSEMBLY FOR CONCENTRIC TUBULAR SYSTEMS

Gerhard Ziemek, Hannover; August Beck, Langenhagen; Ewald Gunia, Hannover; Friedrich Schatz, Langenhagen, and Hans-Joachim Arntz, Berenbostel, all of Germany, assignors to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed June 8, 1972, Ser. No. 261,047
Claims priority, application Germany, June 15, 1971, 2129556; July 20, 1971, 2136176
Int. Cl. F16l *7/00*
U.S. Cl. 138—112 13 Claims



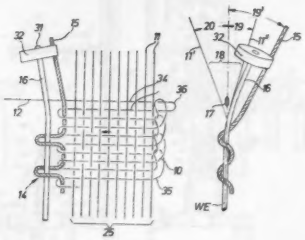
A spacer assembly for a concentric tube system having at least two tubes, to be placed in thermally insulative, concentric relation. An annular arrangement of ring elements with large and small gaps, bolted together and traversed by the inner one of the two tubes; the ring elements are preferably hinged together. A plurality of loops extend inwardly from the annular arrangement for suspending the inner tube in the annular arrangement from at least three different radial directions; the loops are established by thread, wire or ribbon.

3,791,417

METHOD AND APPARATUS FOR PRODUCTION OF A ZIPPER BY WEAVING

Friedrich Glindmeyer, Stolberg; Wilhelm Hennenberg, Alsdorf, and Karl Limpens, Stolberg, all of Germany, assignors to William Prym-Werke KG, Stolberg Rhld, Germany

Filed May 12, 1971, Ser. No. 142,633
Claims priority, application Germany, May 12, 1970, 2023005
Int. Cl. D03d *1/00*
U.S. Cl. 139—11 9 Claims



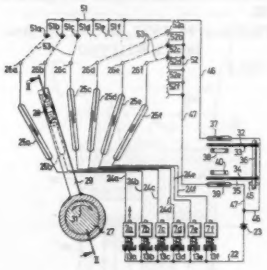
A method of production of a zip fastener by weaving, whereby within the range of the weaving station for the formation of the series of coupling members a continuous profile tape of synthetic material is turned around about a mandrel forming a loop and is bound up in the tape web, which comprises the steps of guiding back and forth the member-forming profile tape as a warp thread shed forming through the web plane, feeding thereby in a cycle continuously the profile cord about said loop-forming mandrel and binding it up by at least one weft thread.

3,791,418

MULTIPLE WEFT MECHANISM FOR A WEAVING MACHINE

Erwin Pfarrwaller, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed June 22, 1971, Ser. No. 155,523
Claims priority, application Switzerland, June 30, 1970, 9863/70
Int. Cl. D03d *47/34*
U.S. Cl. 139—122 W 14 Claims



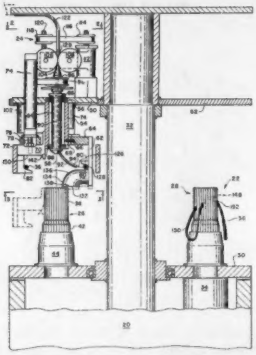
The weft brake is released in programmed sequence to the weaving machine to allow picking of a selected weft and is reengaged in response to the lapse of a predetermined time interval. The time interval is determined by means of an adjustable gap formed by a pair of adjustable cam plates run off the main shaft wherein the gap serves to close the circuit to the weft brake. The time interval can also be terminated by an electronic or pneumatic means independently of the operation of the weaving machine.

3,791,419

APPARATUS AND METHOD FOR FORMING WAVE WINDING FOR DYNAMOELECTRIC MACHINE

Robert E. Arick, Fort Wayne, Ind., and Ralph A. Vogel, Three Rivers, Mich., assignors to Essex International, Inc., Fort Wayne, Ind.

Filed Oct. 16, 1972, Ser. No. 297,654
Int. Cl. B21f 3/00
U.S. Cl. 140—92.1 21 Claims



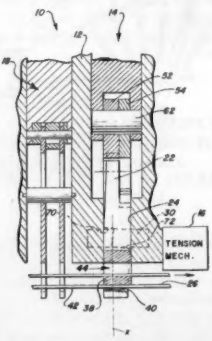
An apparatus and method for forming and placing a skein of wire on a circular array of blades of coil insertion apparatus for subsequent transfer thereby to the slots of a dynamoelectric machine stator core member to form a wave winding. A generally circular skein of wire is generated and is then initially formed into an undulating configuration having at least two convexly curved loop sections respectively joined by connecting portions to intermediate, concavely curved sections. The thus-formed skein is thereafter transferred onto the blades of the coil insertion apparatus with the loop sections being disposed on the exterior of the array and respectively spanning first groups of the blades, the intermediate sections being disposed on the interior of the array and respectively spanning second groups of the blades, and the connecting portions respectively passing between respective pairs of blades at the ends of adjacent first and second groups.

3,791,420

GRIPPING MECHANISM FOR STRAPPING MACHINE

John R. Beach, Elmhurst, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed Aug. 16, 1972, Ser. No. 281,054
Int. Cl. B21f 9/02
U.S. Cl. 140—93.2 18 Claims



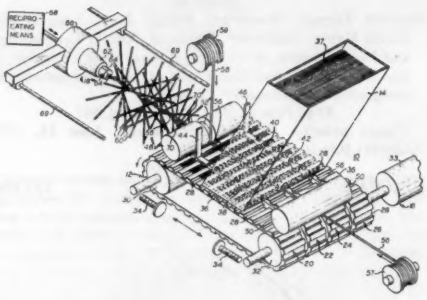
A gripping device for holding the free end of a strap that is being tensioned about an article is disclosed in this application. The gripping device is designed so that the gripping action on the strap is directly proportional to the tension on the strap which results in a self-energizing gripping device. The gripping device consists of a pair of gripping jaws that are pivoted around openings receiving pins that define spaced parallel axes extending longitudinally of the strap. The openings that receive the pins defining the pivot axes are tapered from the opposite sides of the gripping jaws towards the center so that the gripping jaws may pivot between extreme positions about an axis extending generally normal to the length of the strap when tension is applied to the strap. The surfaces which engage the strap also have notches that define teeth and the teeth are configured so that the engaging surface is generally parallel to the parallel axes defined by the pins.

3,791,421

APPARATUS FOR MAKING ARTIFICIAL BRANCHES, BRUSHES, AND THE LIKE

Robert Barrett, Beacon, N.Y., assignor to Gordon Industries, Inc., Newburgh, N.Y.

Filed Aug. 7, 1972, Ser. No. 278,397
Int. Cl. B21f 7/00
U.S. Cl. 140—149 7 Claims

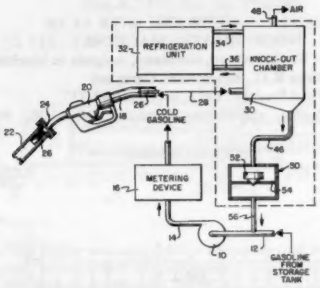


Apparatus for making artificial branches, brushes, etc., from a plurality of filaments held between a pair of twisted wires. Comprises a picker device, the peripheral surface of which is advanceable in a predetermined direction. The picker device is adapted to pick up and contain a plurality of separate bundles of filaments, the filaments being disposed transversely of the direction of movement of the surface. The peripheral surface has a continuous slot or space therein, this slot being parallel to the direction of advancement of the peripheral surface. The slot or space is adapted to receive the lower of the pair of wires, which wire extends outwardly from the exit end of the peripheral surface under the filaments. The apparatus further comprises means for feeding a plurality of filaments to the picker device, drive means for advancing the peripheral surface, means for guiding the second or upper wire into position above the lower wire at the exit end of the picker device, independent drive means for advancing these wires, and means for twisting the wires together.

3,791,422
SERVICE STATION GASOLINE VAPOR RECOVERY SYSTEM

Everette M. Johnson, Fishkill; Herbert E. Vermillion, Wappingers Falls, and Robert S. Wetmiller, Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Nov. 11, 1971, Ser. No. 197,747
Int. Cl. B65b 3/04
U.S. Cl. 141—11 11 Claims

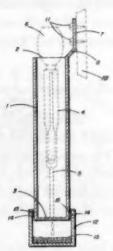


The invention relates to apparatus and method to avoid pollution of the atmosphere due to the passage of gasoline fumes into the latter. The system functions in conjunction with a service station which in its operation transfers gasoline from a storage tank to a motor vehicle. The apparatus includes means to collect fumes from the vehicle tank simultaneous with the injection of liquid fuel to the latter. Thereafter the fumes are vaporized and separated from the air such that only the latter is passed to the atmosphere.

3,791,423
HYDROMETER HOLDER

Wilmarth A. Hildreth, 2005 N. El Dorado St., Stockton, Calif.

Filed Aug. 24, 1972, Ser. No. 283,513
Int. Cl. A47f 5/08; H01m 31/04
U.S. Cl. 141—86 2 Claims

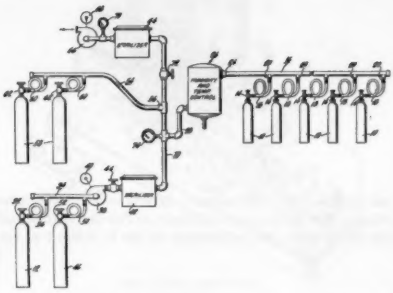


A vertically disposed tubular holder adapted to receive and support a storage battery testing hydrometer in a readily manually accessible position, but at the same time well protected; the holder being arranged with a cup--containing a neutralizing material—to catch and neutralize any battery acid which may drip from the hydrometer after use and upon placement thereof in the holder.

3,791,424
APPARATUS FOR STERILIZING GAS CONTAINERS AND FILLING SAME WITH A STERILE GAS

Gordon N. Stropie, Cherry Hill, and Junstin W. Mills, Jr., Cinnaminson, both of N.J., assignors to Lif-O-Gen, Inc., Cambridge, Md.

Division of Ser. No. 53,394, July 9, 1970, Pat. No. 3,620,265, which is a continuation-in-part of Ser. No. 765,044, Oct. 4, 1968, abandoned. This application May 26, 1971, Ser. No. 147,211
Int. Cl. B65b 55/10
U.S. Cl. 141—92 7 Claims

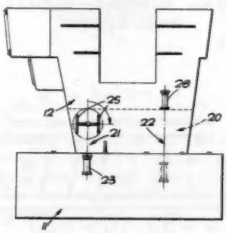


One or more gas containers connected by a conduit means to a feed source are sterilized and sterilely filled by the evacuation of the containers and conduit means to a low pressure, the introduction of a sterilizing agent into the containers and conduit means for a suitable holding period, the removal of the sterilizing agent by a further evacuation of the containers and conduit means, and the introduction of a gaseous feed stock to the containers through a sterilizing unit in the conduit means.

3,791,425
WASHING AND FILLING MACHINES

David John Bowring, Wolverhampton, England, assignor to GKN Sankey Limited, Bilston, Staffordshire, England

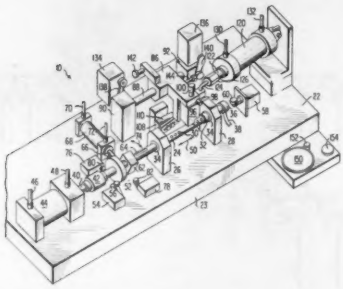
Filed Mar. 23, 1972, Ser. No. 237,410
Int. Cl. B08b 3/02
U.S. Cl. 141—92 9 Claims



A machine for washing and/or filling containers for liquids comprising conveying means for conveying a succession of containers along a path through the machine, washing and/or filling means positioned along the path for carrying out a plurality of washing and/or filling operations, and control apparatus for the machine, the apparatus including a timer for controlling the duration of each of a sequence of operations, the timer comprising an electronic pulse generator arrangeable to emit timing pulses, a pulse counter arranged to count pulses emitted by the generator, and a plurality of selector means, each selector means being arrangeable to emit a signal

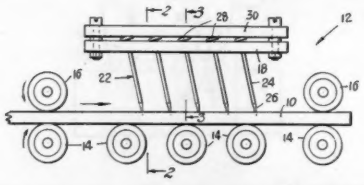
to initiate stoppage of an operation when the number of timing pulses received by the counter reaches a number preset on the selector means.

3,791,426
REED CUTTING MACHINE
William A. Roscoe, Rockville, Md., assignor to M. M. Meason, Inc., Rockville, Md.
Filed Nov. 8, 1972, Ser. No. 304,881
Int. Cl. B27m *3/00;* **B23d** *3/06*
U.S. Cl. 144—2 R **5 Claims**



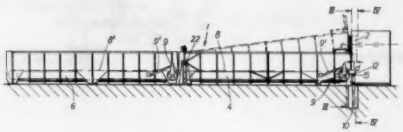
A curved reed is held on a hollow perforated mandrel having a radius complementary to the radius of the reed by means of a vacuum applied through the interior of the mandrel. The tubular mandrel is shifted axially in one direction while being rotated about its axis through an angle subtended by half the width of the reed and is then shifted axially in the opposite direction to the starting point while being rotated about its axis in the same direction through an angle subtended by half the width of the reed. During the foregoing motion of the reed on the mandrel, a cutter is reciprocated rapidly on the surface of the reed adjacent the middle thereof at an angle to the axis of the mandrel to provide a crescent shaped beveled cut. The cutter is then lifted off the reed and the mandrel is rotated in the opposite direction to its initial starting point for a subsequent cutting operation.

3,791,427
APPARATUS FOR SIMULATING BARN WOOD
Lincoln W. Haynes, c/o Haynes Bros. Inc., Wilmington, Vt.
Filed Nov. 30, 1972, Ser. No. 310,933
Int. Cl. B27c *9/00*
U.S. Cl. 144—2 R **8 Claims**



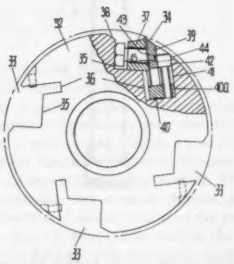
A method of and apparatus for imparting random elongate furrows to the surfaces of wooden panels so as to simulate weathered barn wood. The apparatus comprises means for supporting the panels, a tool carrier member adjacent to and movable with respect to the supporting means, a plurality of resilient spikes mounted on said carrier member and extending toward the supporting means for engagement with the surface of the wooden panel, and a power actuated means for effecting relative movement between the member and the panel. The spikes are loosely carried in apertures of the carrier member such that they can undergo limited swiveling movement with respect thereto. As the spikes engage the surface of the panel, they forcibly dig into the same and simultaneously undergo random limited swiveling movement, thus creating unique, non-parallel furrows therein. The method of the invention comprises engaging the surface of the panel by the spikes carried on the carrier member with respect to the panel, such that the spikes forcibly dig into the surface and undergo a random swiveling movement to thereby cut a series of age-simulating furrows therein.

3,791,428
WOOD SHAVING MACHINE
Karl Schaefer, Neu-Bamberg, Germany, assignor to Machinenfabrik B. Maier K.G., Brackwede, Germany
Filed Nov. 30, 1971, Ser. No. 203,317
Claims priority, application Germany, Nov. 30, 1970, 2058821
Int. Cl. B27l *11/02*
U.S. Cl. 144—172 **9 Claims**



In a wood shaving machine there are provided two juxtaposed, axially parallel shaving heads and two vertically swingable feed troughs, one associated with each shaving head. The pivotal axis of each trough is associated with the trough end that is remote from the shaving heads. During operation, the feed troughs are swung in opposite phase; cutting takes place during the upward swing as the wood logs in the feed trough is urged against the associated shaving head.

3,791,429
ROTARY CUTTER FOR WOODWORKING AND SIMILAR MACHINES
Philip Henry Morris, Evington, England, assignor to Wadkin Limited, Leicester, England
Filed June 7, 1971, Ser. No. 150,629
Claims priority, application Great Britain, June 9, 1970, 27757/70
Int. Cl. B27g *13/00;* **B26d** *1/12*
U.S. Cl. 144—218 **7 Claims**



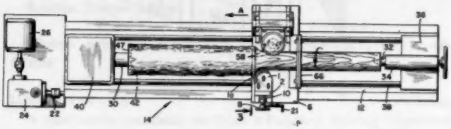
A rotary cutter for woodworking and similar machines in which a single cutter blade or each of a plurality of circumferentially spaced cutter blades is of such thin construction that the "heel" formed on it by jointing (i.e., a rotary sharpening procedure) is kept within acceptable limits whilst extend-

ing across the full thickness of the blade, the blade being supported by a separate backing piece close to its cutting edge. Thereby the need for regrinding of a cutter blade to reduce the width of its heel is avoided.

3,791,430
METHOD AND APPARATUS FOR SIMULTANEOUSLY STRIPPING AND FINISHING LOGS

James A. Hood, P.O. Box 7-70744, Holden, La., and Roy H. Barksdale, 219 E. Roberts St., Hammond, La.

Division of Ser. No. 142,186, May 11, 1971. This application Dec. 6, 1972, Ser. No. 312,753
Int. Cl. B27m *3/00;* **B27l** *1/00;* **B27f** *1/02*
U.S. Cl. 144—326 **3 Claims**



An apparatus and method for stripping and finishing logs, including an arcuately shaped cutting member for simultaneously stripping and finishing the logs, a second cutter member for cutting a longitudinal groove in the thus finished log and a third cutter member for cutting a transverse groove in the thus finished log, both said grooves having an arcuate shape, the radius of which is approximately equal to the radius of the thus finished log.

3,791,431
PROCESS FOR COATING METALS

Lester Steinbrecher, Southampton, and Wilbur S. Hall, Plymouth Meeting, both of Pa., assignors to Amchem Products, Inc., Ambler, Pa.

Continuation-in-part of Ser. No. 113,685, Feb. 8, 1971, which is a division of Ser. No. 791,801, Jan. 16, 1969, Pat. No. 3,585,084, which is a continuation-in-part of Ser. No. 554,336, June 1, 1966, abandoned. This application May 26, 1972, Ser. No. 257,295
Int. Cl. C23f *7/00;* **B44d** *1/36*
U.S. Cl. 148—6.2 **27 Claims**

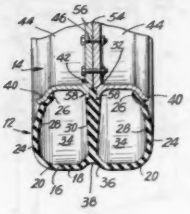
Acidic aqueous coating compositions containing an organic coating-forming material form coatings on metallic surfaces which are immersed therein. The coating composition tends to become unstable as a result of the buildup of metallic ions in the composition. The coating composition is stabilized by removing the metallic ions from the composition or rendering them ineffective for causing the composition to become unstable.

3,791,432
WHEEL AND TIRE THEREFOR

Maximo Calullerovich, Ipiranga Ave. 81, Sao Paulo, Brazil

Filed June 8, 1972, Ser. No. 260,896
Claims priority, application Brazil, June 14, 1971, 0363171
Int. Cl. B60c *5/06*
U.S. Cl. 152—339 **5 Claims**

A wheel having an inflatable tire and designed to be used on automobiles, airplanes, trucks, and the like. The tire has an outer wall provided with an outer tread surface and surrounding a predetermined axis, this outer wall having a pair of opposed side edge regions from which a pair of side walls extend integrally from the outer wall inwardly toward the axis and terminate in inner peripheral edges which surround the axis. An intermediate wall is integral with the outer wall and is situated between and spaced from the side walls, also extending inwardly toward the axis so as to define with the outer walls a pair of air chambers which are separated from each other by the intermediate wall. The wheel includes a suitable mounting structure on which the tire is mounted in such a way that fluid-tight seals are provided at the inner peripheral edges of the side and intermediate walls. In this way if the tire should

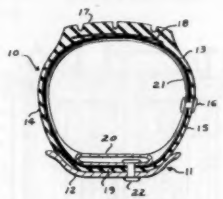


become punctured or lose air pressure for any reason at one of its chambers it will still be capable of providing fully operative service as a result of the air pressure in the other of its chambers.

3,791,433
FILAMENT-WOUND, TOROIDAL TIRE WITH PNEUMATIC RIM-LOCKING TUBE

Howell K. Brewer, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed July 13, 1972, Ser. No. 271,467
Int. Cl. B60c *5/00, 15/02*
U.S. Cl. 152—339 **7 Claims**



A closed membrane, toroidal tire having a cord reinforced rubber tube positioned within the tire casing, and inflatable for automatically urging the inner casing portion in locking relation against the rim of an aircraft or other, vehicular wheel on which it is mounted.

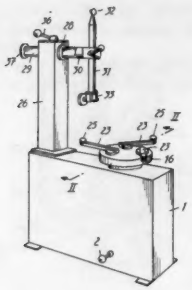
3,791,434
DEVICE FOR FITTING AND REMOVING OF TIRE WHICH EQUIP THE WHEELS OF MOTOR VEHICLES

Victor Duquesne, Quellinstraat 42-44, Antwerpen, Belgium

Filed Mar. 16, 1972, Ser. No. 235,353
Claims priority, application Belgium, Mar. 30, 1971, 59.915
Int. Cl. B60c *25/06*
U.S. Cl. 157—1.24 **5 Claims**

A device for removing or mounting vehicle tires relative to a wheel therefore and having driven means for clamping and rotating the wheel in opposite directions and an arm having

tire removing and mounting tools at opposite ends which arm can be positioned and held with either tool against the tire for



the intended purpose whereby rotation of the wheel will remove or mount the tire on the wheel.

3,791,435

CONTINUOUS DEHYDRATION APPARATUS

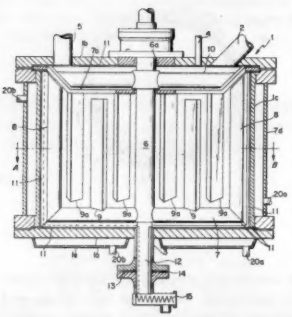
Horst Grasemann, Marl, and Hermann Rose, Essen, both of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed Dec. 17, 1971, Ser. No. 209,133

Claims priority, application Germany, Dec. 18, 1970, 2062452

Int. Cl. B01d *1/30*; **B01j** *1/00*

U.S. Cl. 159—25 A **10 Claims**



Improved drying apparatus for the continuous dehydration of wet orthoboric acid to metaboric acid comprising a vessel fitted with product feed and discharge lines; with gas inlet and vapor outlet lines; and a vertically mounted agitator close fitted to the bottom and wall of the vessel; wherein the agitator has a vane perpendicularly mounted on the agitator shaft in scraping relationship to opposite sides of the vessel wall, on which vane is vertically mounted scraper elements; positioned at the ends of the vane in scraping relationship to the vessel wall, and elongate paddles, positioned intermediate the agitator shaft and the scraper elements at an angle of incidence to the axis of the vane.

3,791,436

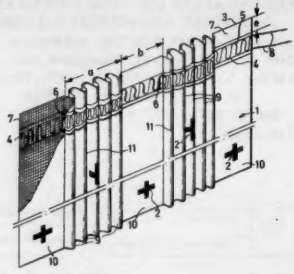
PATTERNED CURTAIN

Ilse Weckbrodt, Michelau, Germany

Continuation of Ser. No. 75,336, Sept. 25, 1970, abandoned. This application Sept. 13, 1972, Ser. No. 288,535

Int. Cl. A47h *13/14*

U.S. Cl. 160—348 **3 Claims**



A patterned curtain panel is lengthwise pleated in symmetry with a pattern on the panel by providing hooking holes disposed symmetrically with the pattern in a heading strip along the top edge of the panel. Crosswise contraction of the panel automatically forms pleats in the same. By placing the hooking holes so that alternate wide and narrow lengthwise sections or strips of the panels are defined, crosswise contraction of the panel, for instance, by means of a pull string, causes the wide sections to be pleated while the narrow sections remain flat.

3,791,437

METHOD OF CONTROLLING AN ELECTRO-MAGNETIC MOLTEN METAL POURING DEVICE

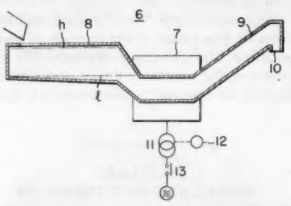
Akira Yamada; Hirohiko Shibutami, and Koichi Hirano, all of Kitakyushu, Japan, assignors to Kabushiki Kaisha Yaskawa Denki Seisakusho, Fukuoka-ken, Japan

Filed Dec. 14, 1970, Ser. No. 97,752

Claims priority, application Japan, Dec. 13, 1969, 44-100329; Feb. 23, 1970, 45-15686

Int. Cl. B22d *27/02, 37/00*

U.S. Cl. 164—49 **2 Claims**



Described is a method of controlling an electro-magnetic molten metal pouring device which comprises an electro-magnetic pump which is adapted to generate a traveling magnetic field by a.c. excitation thereby to impart impellent force to molten metal present inside the pump, a molten metal reservoir located on one side of the pump, and a nozzle positioned on the other side of the pump; wherein supplying of molten metal to the molten metal reservoir is started and stopped respectively by detecting the lower limit level and the upper limit level of molten metal present in the molten metal reservoir, and pouring of the molten metal into a mold is started and stopped respectively by detecting the arrival of the mold and the molten metal fullness in the mold. In addition, disclosed is a method of controlling a molten metal pouring

operation; wherein the final exciting voltage of said electromagnetic pump in the preceding molten metal pouring operation is memorized, and the exciting voltage thereof is gradually raised up for a subsequent molten metal pouring operation, said memorized final exciting voltage in the preceding molten metal pouring operation being regarded as the initial exciting voltage for the subsequent molten metal pouring operation.

3,791,438

PROCESS FOR MANUFACTURING A WEAR-RESISTANT CAST METAL PRODUCT

Kazunori Ikeda, Saitama-ken; Takeo Arai, Tokyo; Takuo Yamamura, and Taichiro Kayama, both of Saitama-ken, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1972, Ser. No. 238,614

Claims priority, application Japan, Mar. 27, 1971, 46-17606

Int. Cl. B22d *27/20*

U.S. Cl. 164—55 **9 Claims**

A cast metal product, such as a bearing, having improved wear resistance and lubricating properties is obtained using the die casting process, wherein a molten metal, such as aluminum, is supplied under pressure into a mold cavity through a conduit by the pushing action of a plunger, by adding to the molten metal in the conduit a thermoplastic resin, such as polyethylene, or a mixture of such resin with a powdered lubricant, such as graphite or a powdered wear-resistant material, such as silicon.

3,791,439

CENTRIFUGAL CASTING APPARATUS

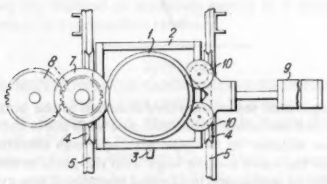
Roland Philip Chapman, 9 Harrison Rd., Headless Cross, Redditch, England

Filed Sept. 25, 1972, Ser. No. 291,551

Claims priority, application Great Britain, Oct. 2, 1972, 45976/72

Int. Cl. B22d *13/10*

U.S. Cl. 164—292 **3 Claims**



A mould is supported in a fluidised bed within a tank which is rotatable to centrifugally cast molten metal introduced into it.

3,791,440

DIE CASTING METHOD

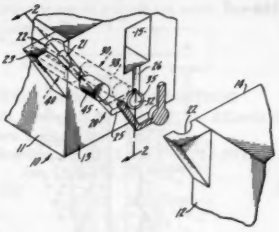
Raymond E. Cross, 2222 N. Elston Ave., Lake Forest, Ill.

Division of Ser. No. 865,397, Oct. 10, 1969. This application Dec. 7, 1970, Ser. No. 95,440

Int. Cl. B22d *13/00, 27/10*

U.S. Cl. 164—113 **5 Claims**

A method of casting high temperature melting point metals and a die arrangement and molten metal feed mechanism for a die casting machine. The method includes gravity filling a shot cylinder with molten metal, cutting off the inlet to the shot cylinder when it is full and then forcing the molten metal in the air-free cylinder into the mold cavity. The machine includes die elements adapted to mate and define a mold cavity at a parting line defined by parting surfaces between the opposed faces of the elements. The die arrangement and molten metal feed mechanism includes a sprue and runner complex also disposed at a parting line, and a molten metal injection or shot cylinder which extends into the parting line or lines. The metal shot cylinder is filled through the sprue with the dies closed. In one aspect of the invention, a molten metal injection plunger acts to seal off the sprue from the shot cylinder during a casting operation, while in another aspect of the invention a separate sprue plunger is utilized to perform this function.



3,791,441

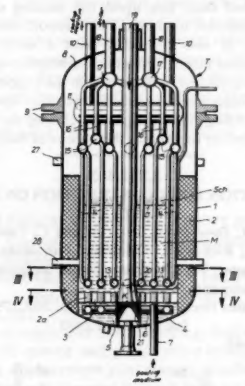
METHOD OF COOLING CRACKED GAS, SYNTHESIS GAS AND SIMILAR GASES

Frohmut Vollhardt, Siegen-Buerbach; Harald John, Ludwigshafen; Wilhelm Rittinger, Schifferstadt; Walter Saum, Ludwigshafen; Artur Sliwka, Kirchheim, and Friedrich Wodtke, Ludwigshafen, all of Germany, assignors to Badische Anilin & Soda Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Continuation-in-part of Ser. No. 811,746, April 1, 1969, abandoned. This application May 3, 1971, Ser. No. 139,878

Int. Cl. F28d *13/00*

U.S. Cl. 165—1 **12 Claims**



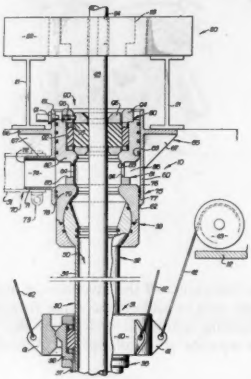
A method of cooling gases, especially cracked gas or synthesis gas from hydrocarbons, in which the gas to be cooled is passed under pressure through a metal bath for transferring heat from said gas to said metal bath, said gas being in direct contact with the molten metal, while the temperature of said metal bath is maintained substantially constant by a cooling medium which is variable as to heat absorption.

3,791,442

COUPLING MEANS FOR A RISER STRING RUN FROM A FLOATING VESSEL TO A SUBSEA WELL

Bruce J. Watkins, Palos Verdes Estates, Calif., assignor to Regan Forge and Engineering Company, San Pedro, Calif.

Filed Sept. 28, 1971, Ser. No. 184,444
Int. Cl. E21b 7/12
U.S. Cl. 166—.5 25 Claims



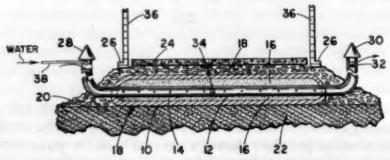
A coupling means connects a riser string of tubing to a floating vessel over a subsea well to which the string is run by a support member, which in one version is a housing mounted beneath the rotary table on the vessel with a tubing hanger support means provided in the housing, and in another version is a support ring mounted in the sea beneath the vessel by constant tension cables run from the vessel. A string of tubing is run through the bore of the rotary table and a central bore through the support member to the subsea well. The tubing hanger supporting the riser string is also run through the table bore and is landed in the support member positioned beneath the table. The support member also in one version has a fluid line coupling means provided integrally thereof for automatically connecting the interior of the riser string of tubing to a vessel associated fluid line upon the landing of the tubing string in the support member. The support member, in the latter version, is also provided with a diverter insert, a blowout-preventer insert, and a packer insert to provide radial passages and a collector passage within the support member to conduct well fluids from a space between an operating string and the surrounding riser string while closing the upper end of the support member to prevent the escape of fluids therefrom.

3,791,443

FOUNDATION FOR CONSTRUCTION ON FROZEN SUBSTRATA

Glenn R. Burt, Deer Park, Tex.; Albert C. Condo, Newtown Square, Pa.; Richard L. Odsather, Fairbanks, Alaska, and Kay E. Eliason, Fort Madison, Iowa, assignors to Atlantic Richfield Company, New York, N.Y.

Filed Dec. 13, 1971, Ser. No. 207,379
Int. Cl. E02d 3/00
U.S. Cl. 165—45 19 Claims



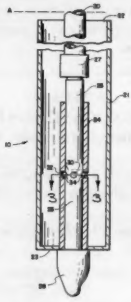
A foundation construction, particularly useful for buildings and other supported structures in Arctic regions wherein a permafrost condition typically prevails, is provided by a construction pad having at least one or more perforated and ventilated conduits positioned within a cushion of air-permeable particulate material, said cushion containing the perforated conduit being substantially thermally isolated from the supported structure by means such as encapsulating with an insulating material. Generally, the pad is overburdened with, or imbedded in, a suitable gravel fill material. The pad can substantially reduce, and in certain instances eliminate, the necessity of providing piling supports in Arctic regions and furthermore provides both a thermal barrier restricting heat flowing downward from the building to the frozen substrata and a type of thermal shunt blocking heat from the structure while admitting a certain amount of geothermal heat flowing upward from the ground to an ambient air heat sink.

3,791,444

LIQUID GAS SEPARATOR

Weldon W. Hickey, Box N, Salmon, Idaho

Filed Jan. 29, 1973, Ser. No. 327,673
Int. Cl. E21b 43/00
U.S. Cl. 166—54 8 Claims



A float operated separator valve attached at the bottom of an oil-gas well including a delivery pipe with ports therein, a valve sleeve slidable on the pipe with openings therethrough which when the valve is open align with the ports in the pipe, the sleeve being positioned inside and connected to a cylindrical float with its top open for receipt of fluid. The ports and openings being in alignment to provide a passage up the delivery pipe when the float is full of fluid, but as the fluid in the float drains the float lifts due to buoyancy, thereby closing off the passage.

3,791,445

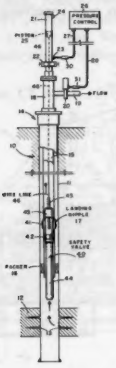
WIRELINE OPERATED SAFETY VALVE SYSTEM

Martin E. True, Houston, Tex., assignor to Esso Production Research Company, Houston, Tex.

Filed May 22, 1972, Ser. No. 255,631
Int. Cl. E21b 43/12
U.S. Cl. 166—72 12 Claims

A subsurface safety valve system for controlling the flow of oil and/or gas production fluids through a well pipe. A valve assembly is installed in the well pipe a predetermined depth below the surface. A wire-line connects the valve assembly to surface facilities which include apparatus for maintaining sufficient tension on the wireline to hold a movable valve element in the valve assembly in open position and for releasing ten-

sion on the wireline to permit the valve element to move to closed position to prevent flow of fluids through the valve assembly. A spring exerts a downward force to move the valve element to its closed position.



3,791,446

METHOD FOR STIMULATING WELL PRODUCTION

Jack F. Tate, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 82,182, Oct. 19, 1970, abandoned. This application June 25, 1971, Ser. No. 157,051

Int. Cl. E21b *43/27*

U.S. Cl. 166—307 **6 Claims**

The production of hydrocarbons from a subterranean hydrocarbon-bearing formation containing acid-soluble components, such as one composed at least in part of dolomite or limestone, is stimulated by injecting into the formation a composition comprising an aqueous solution of a mineral acid having dissolved therein a vinylpyrrolidone polymer. The increase in the permeability and porosity of the formation achieved utilizing the method of invention results in a substantial improvement in hydrocarbon recovery.

3,791,447

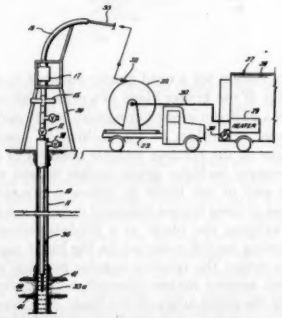
WELL METHODS FOR SAND BRIDGE REMOVAL USING SMALL DIAMETER TUBING

Arthur W. Smith; Ray A. Plummer, and Charles Wayne Johnson, all of P.O. Box 3047, Houston, Tex.

Division of Ser. No. 873,932, Nov. 4, 1969, abandoned. This application Apr. 28, 1971, Ser. No. 138,066

Int. Cl. E21b *21/00, 37/00*

U.S. Cl. 166—311 **4 Claims**



Well methods using small diameter tubing introduced into and withdrawn from the well by an injector apparatus, for removing sand bridges from wells. The tubing is introduced into and withdrawn from the well by the injector from a tubing-holding reel and introduction of an inert gas such as nitrogen through the small diameter tubing breaks up the sand bridge and carries the sand out of the well in gasified suspension. Other gases may also be introduced through the small diameter tubing for sand bridge removal. The methods are especially suitable for use in petroleum wells, but may if suitable be used in water wells.

3,791,448

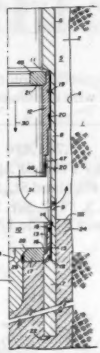
WELL COMPLETION METHOD

Frank J. Schuh, Dallas, Tex., assignor to Atlantic Richfield Company, New York, N.Y.

Filed Dec. 11, 1972, Ser. No. 313,991

Int. Cl. E21b *33/16, 21/00*

U.S. Cl. 166—291 **9 Claims**



A downhole well tool having at least one aperture therein for communication between the interior and exterior thereof and means for sealably opening and closing said aperture, the means for opening said aperture having means for receiving an opening plug, the opening plug being adapted to receive a bypass wiper, and the means for closing the aperture being adapted to receive a shutoff plug. A well completion method utilizing the tool above-described wherein residual liquid outside the tool is removed by passing a second liquid into the interior of the tool, through the aperture of the tool, and up the annulus between the tool and the wellbore. The second liquid is followed by a third liquid. The third liquid is displaced into said annulus through said aperture by cement, after which the tool is closed.

3,791,449

TELESCOPING DISPLACEMENT JOINT

Chudleigh B. Cochran, Houston, Tex., assignor to Brown Oil Tools, Inc., Houston, Tex.

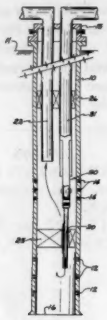
Filed Oct. 13, 1971, Ser. No. 188,878

Int. Cl. E21b *23/00, 37/00*

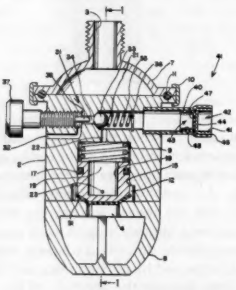
U.S. Cl. 166—312 **16 Claims**

Method and apparatus for displacing drilling fluids from between axially spaced well packers in a multiple string well. A telescoping displacement joint may be attached at the lower end of the string which passes through both packers. The joint is initially in a retracted position leaving an annular space between the joint and the lower packer. After a second string is run, circulating fluid is pumped down the first string, out of the joint, up through the annular space, into the area between packers and out the second string to displace drilling fluids accumulated between packers. Then pressure is applied to the joint, causing a seal carrying portion thereof to extend into sealing engagement with the lower packer. The joint comprises an inner tubular member telescopically engaging an outer tubular member and adapted for limited axial movement

from a retracted to an extended position. The joint carries a first seal assembly between the inner and outer tubular members and a second seal assembly on the inner tubular member for sealing engagement with the lower packer.



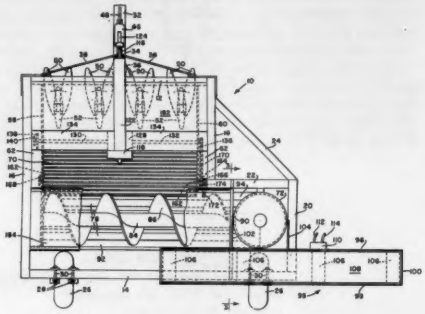
3,791,450
ON-OFF FIRE SPRINKLER
Edward J. Poitras, 198 Highland St., Holliston, Mass.
Filed Apr. 3, 1972, Ser. No. 240,575
Int. Cl. A62c *37/08*
U.S. Cl. 169—37 **14 Claims**



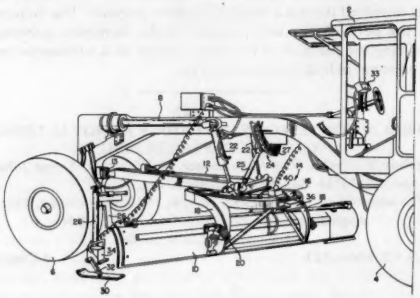
Disclosed in a fire sprinkler having a valve body that defines inlet and outlet openings joined by a flow passage possessing a valve seat. A valve head is movable relative to the valve seat between open and closed positions by either a primary condition responsive actuator or an auxiliary condition responsive actuator. In response to a given condition associated with the generation of combustion products, for example, a given ambient temperature, the primary actuator first causes an operator mechanism to open the valve and then after cessation of the given condition induces reclosing thereof. The auxiliary actuator causes the operator mechanism to permanently open the valve in response to a different, more serious condition such as a higher ambient temperature.

3,791,451
ROOT CROP HARVESTING IMPLEMENT
Richard David Zaun, and Richard Wayne Hook, both of Des Moines, Iowa, assignors to Deere & Company, Moline, Ill.
Filed Dec. 17, 1971, Ser. No. 209,124
Int. Cl. A01d *17/00*
U.S. Cl. 171—58 **12 Claims**

A root crop harvester includes a main frame, a plurality of digger wheels on the front of the main frame, conveyor means supported on the frame to receive roots from the digger wheels and deliver the same to a transversely extending auger conveyor which moves the roots to a vertical auger conveyor. An additional conveyor mounted on the upper end of the vertical auger conveyor in root-receiving relationship therewith moves the roots laterally outwardly to a deposit area. In one embodiment of the invention, a plurality of grab rolls are associated with the transverse auger conveyor to clean the roots as they are moved to the vertical auger conveyor.



3,791,452
CONTROL SYSTEM FOR ROAD GRADER
George E. Long, Monroe; Floyd C. Johnson, Seattle, and Dennis L. Reese, Kirkland, all of Wash., assignors to Grad-Line Inc., Woodinville, Wash.
Filed Mar. 17, 1971, Ser. No. 125,293
Int. Cl. E02f *3/76*
U.S. Cl. 172—4.5 **8 Claims**



A control system for a road grader adapted to maintain the working edge of the grader blade in a preset datum plane so as to establish a uniform graded condition of the surface worked by the blade, regardless of the inclination assumed by the motor grader or the relative angular position of the blade itself. The system includes grade sensor means mounted adjacent one end of the blade to follow a pre-selected grade datum, slope sensing means mounted in fixed relation with the blade for keeping the blade at a predetermined slope with rotation sensing means mounted on the blade supporting ring or circle to detect the relative angular position of the blade. The rotation sensing means provides a correction signal for maintaining the slope angle of the blade at a value which will keep the "cross slope" of the surface established at a predetermined value regardless of the rotary position of the blade relative to the direction of travel.

3,791,453

HARROW

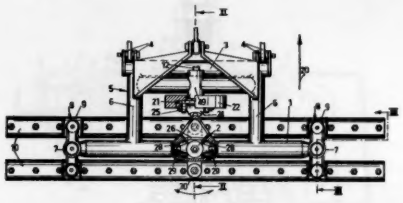
Pieter Adriaan Oosterling, Nieuw-Vennep, Netherlands, assignor to H. Vissers N.V., Nieuw-Vennep, Netherlands

Filed Dec. 1, 1971, Ser. No. 203,607

Claims priority, application Netherlands, Dec. 2, 1970, 70,17581

Int. Cl. A01b *35/00*

U.S. Cl. 172—53 4 Claims



In a harrow comprising reciprocating driven harrow beams directed transversely to a forward movement of its frame, said harrow beams are connected to each other and to the frame by means of parallel levers swingably beared on the frame and to the harrow beams.

In order to compensate differences in the distances between the engaging points of the levers on the harrow beams and/or differences in the lengthes of these levers, the levers consist each of two lever parts which are beared round a common axis swingably with respect to each other on the frame.

3,791,454

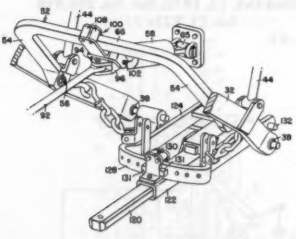
MULTI-LOAD TRACTOR HITCH SYSTEM

James Allan Koch, Hudson, and Donald Leroy Henderson, Waterloo, both of Iowa, assignors to Deere & Company, Moline, Ill.

Division of Ser. No. 293,436, Sept. 29, 1972. This application May 16, 1973, Ser. No. 360,707

Int. Cl. A01b *63/110*

U.S. Cl. 172—7 3 Claims



A tractor includes a hitch system comprising spaced lower draft links carrying draft hooks at their distal ends and an upper center link in the form of an extensible and retractable hydraulic actuator and a drawbar. An inverted U-shaped arch member has opposite legs respectively pivotally connected to the draft links at locations intermediate the ends thereof by means establishing a horizontal transverse axis about which the arch member is swingable fore and aft. A swivel bracket including rollers is mounted for rolling movement along the transverse bight portion of the arch member between a stored position on one of the legs of the arch member and an operative position on the transverse bight portion of the arch member. The hitch structure may be arranged in a three-point hitch mode by suspending the center link-forming hydraulic actuator from the bight portion of the arch member by spring means and by connecting a draft hook to the end of the piston rod of the center link-forming actuator. The hitch structure may be arranged in a weight transfer mode by placing the swivel bracket in its operative position, by connecting the end of the piston rod of the center link-forming actuator to the bracket and by connecting a force transmitting member or link between the swivel bracket and the implement to be towed. The hitch structure includes draft responsive means for initiating automatic draft and weight transfer control, the draft responsive means being, in one embodiment, responsive to forces imposed on the lower draft links or on the drawbar and being responsive in a second embodiment to draft forces imposed on the center link-forming actuator.

3,791,455

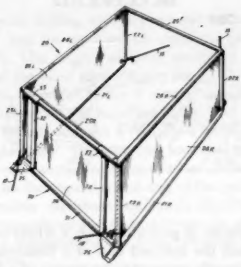
SCRAPING DEVICE HAVING A SWINGABLE GATE

Jack L. Stout, 1008 W. California St., and Jimmy Stout, Rt. 2, both of Seymour, Tex.

Filed Sept. 17, 1971, Ser. No. 181,326

Int. Cl. E02f *3/60*

U.S. Cl. 172—26.5 4 Claims



A scraping device adapted to be drawn back and forth across the silt or mud loaded bottom of a stock tank or pond for example, being drawn in one direction by a towing vehicle to position the device for loading, and being drawn in the opposite direction to remove and discharge the load over the pond dam. The device includes a rectangular frame having side walls with the bottom edges of the side walls forming runners or skids. A swingable gate defines a rear end wall, and is swingable inwardly of the device about a horizontal axis at the top of the frame with outward movement being limited to a substantially vertical position to define the closed end wall position.

3,791,456

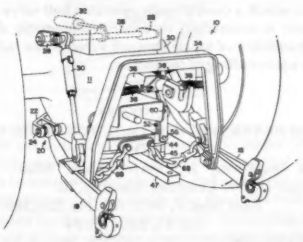
TRACTOR HITCH SYSTEM INCLUDING A VERTICALLY SWINGABLE DRAWBAR POWERED BY A DRAFT LINK ACTUATOR

James Allan Koch, Hudson, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 21, 1971, Ser. No. 191,316

Int. Cl. A01b *59/06*, *59/043*

U.S. Cl. 172—450 10 Claims



A tractor includes a hitch system comprising a three-point hitch and a vertically swingable drawbar. Sway chains are as-

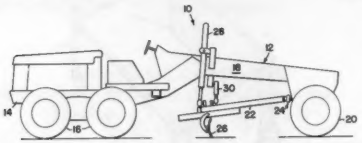
sociated with the lower draft links of the three-point hitch and have one of their ends optionally connectible either to a collar pivotable about the axis of swinging of the draft links to substantially prohibit the links from swaying throughout their paths of movement, or to a bracket fixed to a swingable frame carrying the drawbar to prohibit sway only when the links are in a raised transport position. The drawbar frame is releasably latched to the chassis of the tractor in a horizontal transport position and when the latch is released and the sway chain ends are connected to the bracket, the drawbar may be raised and lowered by actuation of the lift cylinder for raising and lowering the draft links.

3,791,457

UNIVERSAL CONNECTION FOR BLADE-SUPPORTING DRAFT FRAME OF A MOTOR GRADER

Paul Edmund Hanser, Moline, Ill., and Thomas Edward Gebauer, Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Dec. 1, 1972, Ser. No. 311,156
Int. Cl. E02f 3/12
U.S. Cl. 172—781 **8 Claims**



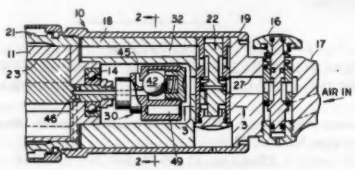
A motor grader is provided with a wheel-supported main frame to which the forward end of a blade-supporting draft frame is universally connected by means of a ball and socket connection.

3,791,458

STALL TORQUE AIR SHUT-OFF CONTROL FOR PNEUMATIC NUT RUNNERS

William K. Wallace, Barneveld, N.Y., assignor to Chicago Pneumatic Tool Company, New York, N.Y.

Filed Oct. 30, 1972, Ser. No. 301,942
Int. Cl. B25b 23/14
U.S. Cl. 173—12 **5 Claims**



A pneumatic nut runner having an air vane stall torque motor to which a centrifugally operable ball valve pressure air relief unit is connected to control pneumatic shifting to a closed condition of an air shut-off valve in the motor air-feed passage upon stalling of the motor.

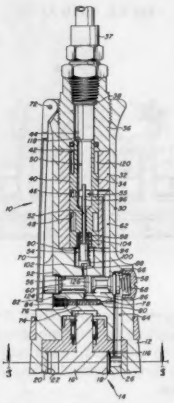
3,791,459

MOTOR REVERSING CONTROL FOR FLUID OPERATED TOOL

William Workman, Jr., Spring Lake, Mich., assignor to Gardner-Denver Company, Quincey, Ill.

Filed Sept. 5, 1972, Ser. No. 286,385
Int. Cl. B25b 23/14
U.S. Cl. 173—12 V **9 Claims**

An automatic reversing control for fluid operated rotary tools which is responsive to a fluid pressure increase in a motor inlet passage to cause a reversal of the direction of motor rotation. A shiftable spool valve is biased to reverse the motor by pressure fluid acting on the valve spool. A spring biased check valve is operable to valve biasing fluid to actuate



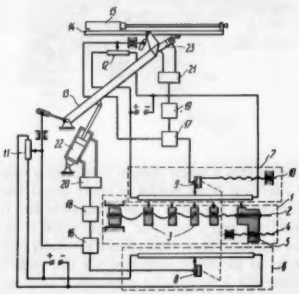
the spool valve in response to sensing a predetermined fluid pressure in the motor inlet passage. An operator actuated start valve is disposed between the reversing valve and the motor to initiate and control the operating cycle of the tool.

3,791,460

PROGRAM CONTROL OF THE BOOM POSITIONER AND THE FEEDER OF THE DRILLING TOOL OF A SELF-PROPELLED DRILLING

Artem Mikhailovich Tkachenko, 11 linia, 198, kv. 20; Karl Batyrbekovich Mustafin, 1 Mikroraion, 54, kv. 46, and Gennady Alexeevich Starodubov, ulitsa Khaliulina, 22, all of Alma-Ata, U.S.S.R.

Filed Oct. 12, 1972, Ser. No. 296,818
Int. Cl. E21c 11/00
U.S. Cl. 173—43 **2 Claims**

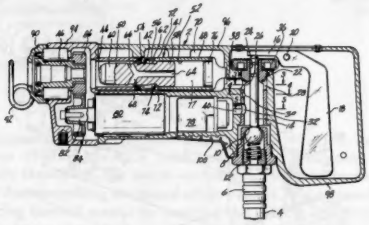


A program controller of the boom positioner and the feeder of a drilling tool, which comprises a program carrier fashioned as a variable pitch screw and nuts mounted on said screw with the possibility of longitudinal travelling, the number of said nuts not corresponding to the programmed number of holes, plus a drive for insuring the reciprocating motion of the screw.

3,791,461
ROTARY-IMPACT TOOLS

Claude Rosselet, Founex near Nyon, Switzerland, assignor to Olin Authier S.A., Biere (Vaud), Switzerland

Filed Mar. 13, 1972, Ser. No. 233,915
Claims priority, application Switzerland, Mar. 16, 1971, 003807/71
Int. Cl. B25f *1/00*; B25d *9/00*
U.S. Cl. 173—48 5 Claims

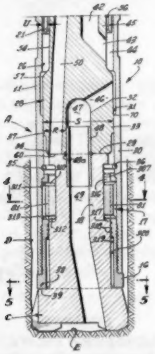


A pneumatic tool capable of imparting rotary and axial movement to a bit, either singly or together. A single adjustable member selectively provides communication between a pneumatic inlet and only the rotating portion of the tool, between the inlet and the impacting portion of the tool, or between the inlet and both the rotating and impacting portions. Additionally, the adjustable member can be used to provide a blast of pneumatic fluid from the tool.

3,791,462
PERCUSSION ANVIL BITS

Alfred R. Curington, 9418 Opelika St., Houston, Tex., and Archer W. Kammerer, Jr., 1900 Yucca Ave., Fullerton, Calif.

Filed Mar. 29, 1972, Ser. No. 239,046
Int. Cl. E21c *3/00*
U.S. Cl. 173—104 14 Claims

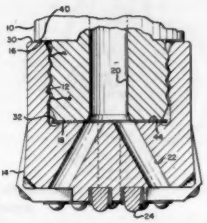


Anvil bits for use in drilling a formation under the impact action of a hammer piston reciprocable in a rotatable housing, the anvil portion of the bit having generally chordal surfaces engageable by driving members connected to the housing for transmitting rotary motion and torque from the housing to the bit.

3,791,463
DRILL HEAD ASSEMBLY

Bernard A. Pearson, Bothell, Wash., assignor to Smith-Williston, Inc., Seattle, Wash.

Filed Nov. 3, 1972, Ser. No. 303,328
Int. Cl. E21c *13/06*
U.S. Cl. 173—80 5 Claims

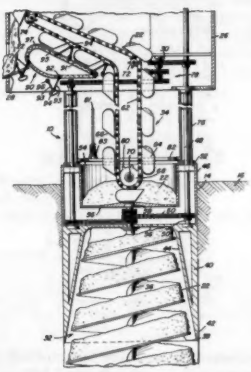


An impact rock drilling tool is provided with a removable head assembly and an anvil which receives percussive and rotational loads. The anvil and head assembly are threaded together to hold the head assembly on the anvil. The anvil has a radially outer shoulder surface which opposes a radially outer impact surface on the head assembly. The anvil also has an end surface which opposes a radially inner impact surface on the head assembly. Deformable washers are interposed between the impact surfaces of the head assembly and the opposed surfaces on the shoulder and end of the anvil respectively. The deformable members uniformly distribute the load across the entire surfaces and thus increase the effective bearing surfaces for transmitting the load between the anvil and the head assembly.

3,791,464
AUGER DRILL AND CONVEYOR

Felix I. Stewart, 1309 O'Shaughnessey Ave., Huntsville, Ala.

Filed Mar. 26, 1973, Ser. No. 344,503
Int. Cl. E21b *3/02*
U.S. Cl. 175—88 8 Claims



A drill for earth boring incorporating an auger combined with a bucket-type elevator or conveyor associated in such a manner that rotation of the auger and downward movement in a vertical direction will bore a hole into the earth with the soil being escavated by the conveyor thereby facilitating continuous boring of a hole without requiring that the auger be periodically removed from the bore hole and cleaned by high speed rotation.

3,791,465
BORING TOOL

Emile Metge, Paris, France, assignor to Union Industrielle Blanzy-Quest, Paris, France

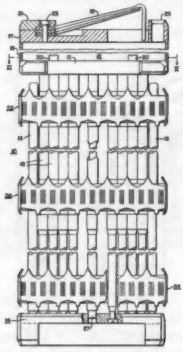
Filed Nov. 2, 1972, Ser. No. 303,155
Claims priority, application France, Nov. 10, 1971, 7140324
Int. Cl. E21c 13/01
U.S. Cl. 175—373 7 Claims

Boring tool comprising a wheel in the form of a disk, formed by a substantially circular metal support provided at its periphery with elements made of a hard substance, said elements being plates arranged in a substantially contiguous configuration, the plane of said plates coinciding substantially with the plane of symmetry of said wheel perpendicular to the axis of rotation so as to produce a continuous crown.

3,791,466
LOW PARASITIC CAPTURE FUEL ASSEMBLY STRUCTURE

John F. Patterson, Murrysville; Elmer A. Bassler, Jr., and Edward J. Choby, both of Irwin, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 825,889, May 19, 1969. This application Mar. 21, 1972, Ser. No. 236,780
Int. Cl. G21c 3/34, 3/30
U.S. Cl. 176—78 17 Claims

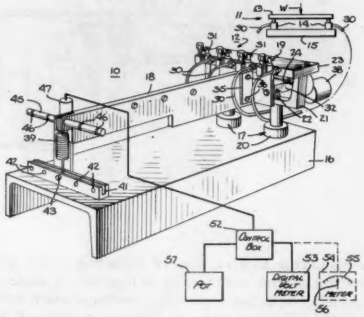


The basic fuel assembly structure for a nuclear reactor comprises a skeleton made up of individual hollow tubes composed of a zirconium base alloy, such as Zircaloy, and held in place by Inconel or stainless steel grids disposed between stainless steel end nozzles at the top and the bottom of the structure. The tubes serve as guide thimbles for cylindrical control elements strategically located in a square array of fuel rods held in place by spring fingers on the "egg-crate" grids. The guide thimbles are attached to the top and bottom nozzles and the grids by mechanical joints without welding dissimilar metals.

3,791,467
SCALE HAVING A RESTRAINED MOVABLE BALANCING MEMBER

Burt L. Swersey, 313 W. Hartsdale Ave., Hartsdale, N.Y., and Peter I. Fried, 61 Old Knollwood Rd., White Plains, N.Y.

Continuation-in-part of Ser. No. 89,233, Nov. 13, 1970, abandoned. This application Nov. 12, 1971, Ser. No. 198,133
Int. Cl. G01g 23/02, 23/14, 3/14
U.S. Cl. 177—157 32 Claims

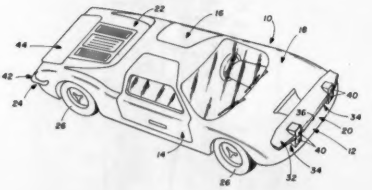


The balance beam of the scale is provided with a flexure member such as a spring at one end which serves to react against the pivoting force exerted on the beam at the opposite end. A transformer is also mounted on the end of the beam to emit a signal proportional to the displacement of the beam from a zero-position. The flexure member is calibrated so that the signal of the transformer is proportioned to a measurement of weight of the mass being weighed on the scale.

3,791,468
DYNAMIC LOAD INCREASING AUTOMOBILE BUMPER

John F. Bryan, Jr., 3212 Mapleleaf Cir., Dallas, Tex.

Filed Sept. 16, 1971, Ser. No. 181,112
Int. Cl. B60r 19/02; B61f 19/04; B62d 37/02
U.S. Cl. 180—1 FV 11 Claims



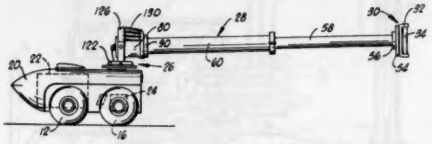
In an automobile bumper configuration, a front bumper is supported above the low front end of an automobile body at the height required by Federal regulations. The bumper has a thin cross section so as not to impede vision and is shaped as an airfoil which is oriented to force the front end of the automobile downwardly in response to air flowing rearwardly relative to the front of the automobile. The bumper is supported on the body by structure which also encloses the headlights of the automobile.

3,791,469

APPARATUS FOR TOWING SKIERS

Forrest A. Prosser, Rt.1, Chanute, Kans., and Leroy E. Everitt, Box 273, Girard, Kans.

Filed Mar. 2, 1972, Ser. No. 231,224
Int. Cl. B62d 51/04; B62m 27/02
U.S. Cl. 180—6 R 10 Claims



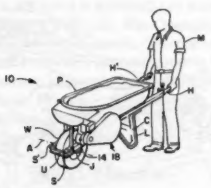
Apparatus for towing skiers including a wheeled, engine-driven vehicle having a telescoping boom extending rearwardly therefrom, the boom carrying throttle and brake controls for controlling the speed of the vehicle, and connected to steering control means for steering the vehicle upon rotation of the boom about its longitudinal axis. At its end opposite the vehicle, the telescoping boom carries hand controls connected to the throttle and brake controls to permit a skier towed behind the vehicle to remotely control the speed of the engine.

3,791,470

MOTORIZED WHEELBARROW

William A. Baddore, and Paul E. Baddore, both of Dillsburg, Pa., assignors to Baddorf & Sons, Inc., Dillsburg, Pa.

Filed Oct. 26, 1971, Ser. No. 192,541
Int. Cl. B62d 51/04
U.S. Cl. 180—19 R 8 Claims



A motorized wheelbarrow having engine and associated drive parts mounted adjacent the wheel axle under the body overhang; the gas tank is mounted on the opposite side of the wheel from the motor and at a special angle to provide fuel output from an end of the tank at all normal operating angles; the wheel is dog driven and all parts of the drive mechanism and motor are adapted for easy access and quick installation on common wheelbarrows using only a brace and bit plus the holes ordinarily found; an embodiment is disclosed in which the wheel is laterally shifted and provided with a cylindrical tread for counter-balancing purposes.

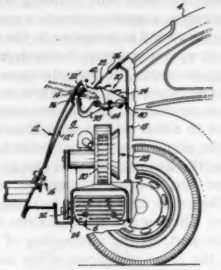
3,791,471

SLOTTED CANOPY ARRANGEMENT FOR VOLKSWAGEN ENGINE COMPARTMENTS

Warren H. Buser, 3067 Beacon Ave. So., Seattle, Wash.

Filed Oct. 27, 1972, Ser. No. 301,455
Int. Cl. B60k 11/08; B62d 25/10
U.S. Cl. 180—54 A 9 Claims

Present-day Volkswagen engine compartments tend to overheat, but the condition is relieved by providing a slot in the body of the automobile, between the air intake means in the overhanging edge portion of the body, and the hinged end portion of the hood, while at the same time assuring that the hood can be closed and latched adjacent the lower end thereof, as well as raised to the full extent necessary for access to the compartment.

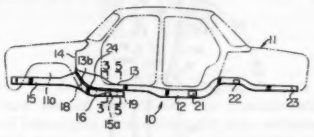


3,791,472

VEHICLE BODY CONSTRUCTION

Hiroshi Tatsumi, Tokyo, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed Sept. 13, 1971, Ser. No. 179,807
Int. Cl. B60k 5/12; B62d 21/00
U.S. Cl. 180—64 R 10 Claims



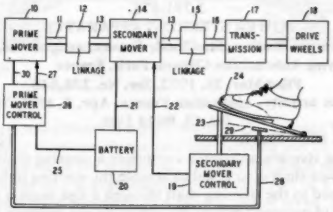
An underbody structure including a pair of transversely spaced, longitudinally extending side sills, a floor panel connected at its lateral edges to the side sills, a pair of transversely spaced, longitudinally extending side rails having longitudinally rearwardly extending extensions, an engine rear mount member transversely extending between and rigidly connected to the extensions of the side rails, and a pair of bridges rigidly connecting rear end portions of the extensions to the adjacent portions of the side sills. The extensions, the engine rear mount member, torque boxes and the connecting bridges are vertically separated from the floor panel.

3,791,473

HYBRID POWER TRAIN

Charles L. Rosen, Teaneck, N.J., assignor to Petro-Electric Motors Ltd., New York, N.Y.

Filed Sept. 21, 1972, Ser. No. 290,784
Int. Cl. B60k 1/00
U.S. Cl. 180—65 A 9 Claims



The disclosed hybrid power train for a self-propelled vehicle is designed to reduce the emission of atmospheric pollutants.

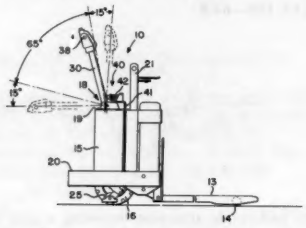
The chemically fueled prime mover and the secondary-battery powered electric dynamotor are joined together and joined to the output shaft by fixed ratio rotating linkage. The prime mover is operated as a quasi-constant -torque device, with its torque able to be varied in response to the state of charge of the battery or to operator torque demands in excess of certain predetermined amounts. The instantaneous torque output of the combined combustion engine/electric motor power train is controlled by a mechanical accelerator control which causes the dynamotor to either add to or subtract from the torque produced by the prime mover. When added torque is required by the vehicle, the dynamotor takes energy from the storage battery. When less torque is required, the extra energy produced by the prime mover is fed by the dynamotor into the storage battery. The low pollution qualities of this power train are realized, in part, by the uncoupling of the prime mover throttle from the rapid variations of the accelerator control typical of urban driving.

3,791,474

MOTION SELECTOR DEVICE FOR A LIFT TRUCK

Harold A. Stammen, New Bremen, and Eugene G. Bruns, Maria Stein, both of Ohio, assignors to Crown Controls Corporation, New Bremen, Ohio

Filed Apr. 2, 1971, Ser. No. 130,654
Int. Cl. B60k *29/02*
U.S. Cl. 180—77 H **15 Claims**



A control device for a lift truck of the type having a drive and brake control mechanism, such as a tiller, spring loaded into either a braking or driving arc includes a support mounted on the truck adjacent the tiller and means mounted on the support for restraining the tiller upon its release from entering one of the arcs and for maintaining the mechanism within the other arc to effect the motion control determined by that other arc. In its non-braking mode, the restraining means prevents the tiller from positioning itself in the braking arc and permits the truck to coast. In its braking mode, it prevents the tiller from positioning itself in the driving arc and causes the truck to stop. The restraining means is sufficiently resilient to be overpowered by physically moving the tiller into the other arc to engage the brake (non-braking mode) or to disengage the brake (braking mode) to thereby stop or start the truck.

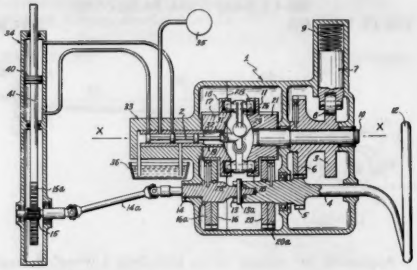
3,791,475

POWER STEERING APPARATUS

Jean Georges Cadiou, St. Cloud, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed Mar. 28, 1972, Ser. No. 238,845
Claims priority, application France, Apr. 2, 1971, 71.11672
Int. Cl. B62d *5/06*
U.S. Cl. 180—79.2 R **12 Claims**

Power steering apparatus comprises a steering shaft, an intermediate shaft connected to actuate the steering linkage and connected to the steering shaft through a lost motion connection, fluid-operated means for actuating the steering linkage, and a distributor for controlling said actuating means. The distributor is actuated in response to relative angular displacement between the steering and intermediate shafts and means are provided for amplifying the effect of said displacement on the distributor. The power steering apparatus is associated in a



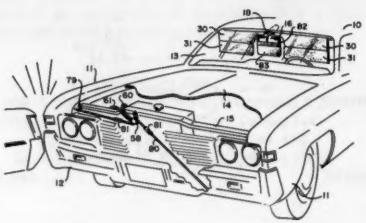
single casing with means for automatically straightening the steered wheels of the vehicle.

3,791,476

PROTECTIVE SHIELD FOR MOTOR VEHICLE OCCUPANT

James H. Wernig, General Delivery, Kennebunkport, Maine

Filed Oct. 27, 1969, Ser. No. 869,697
Int. Cl. B60r *21/08*
U.S. Cl. 180—91 **9 Claims**



Shields for minimizing head injuries to front seat occupants of propelled vehicles as a result of being thrown against the windshield of the vehicle by a collision which are automatically moved from a stored position to a position between the occupants and the windshield in advance of significant deceleration of the vehicle. The shields are constructed and disposed so that they afford more complete protection to all of such occupants and interfere to the minimum extent with their vision when the shields are in operative position.

The shields normally serve as the sun visors of the vehicle and are made of two panels which are normally held in overlying positions but are moved to side by side position when the shields are automatically interposed between the front seat occupants and the windshield so that they cover a greater area of the windshield and afford more protection.

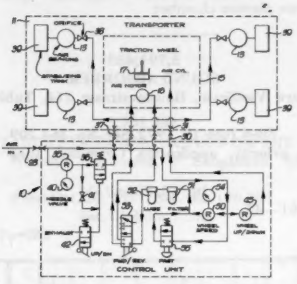
The shields can, however, be moved manually in the same manner as conventional sun visors from their stored position to a position in which they serve to shade the front seat occupants' eyes from glare and back to stored position without disabling the mechanism which automatically operates them in the event of a collision or extending the shields.

3,791,477

CONTROL UNIT FOR AIR CUSHION SYSTEMS

Robert E. Burdick, Santa Barbara, Calif., assignor to Rolair Systems, Inc., Santa Barbara, Calif.

Filed Sept. 13, 1972, Ser. No. 288,599
Int. Cl. B60v 1/00
U.S. Cl. 180—117 4 Claims



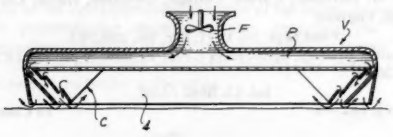
A control unit for an air cushion transporter having air bearings and an air powered drive motor. A control column connectible to the transporter mechanically and pneumatically, and including an air bearing on-off control, a drive motor forward-reverse control, and a high pressure start control for the drive motor to reduce starting time when moving heavy loads with large inertia.

3,791,478

APPARATUS FOR CONFINEMENT OF AN AIR CUSHION OF A VEHICLE RIDING ON SAME

Philippe Marie Remon-Beauvais, Ris-Orangis; Jean-Luc Barbot, Drancy, and Michel Gravelle, Marcoussis, all of France, assignors to Etat Francais represente par le Ministere d'Etat charge de la Defense Nationale-Delagation Ministerielle pour l'Armement, Paris, France

Filed Mar. 29, 1972, Ser. No. 239,163
Claims priority, application France, Mar. 31, 1971, 71.11229
Int. Cl. B60v 1/16
U.S. Cl. 180—121 10 Claims



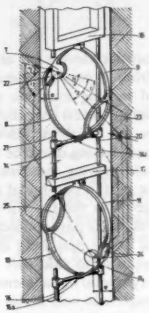
A gas cushion for a vehicle which rides thereon is formed by introducing gas downwardly under pressure through a plurality of peripheral passages at an angle of 30 to 45° relative to the vertical, the gas passing into a central cushion. Arrayed externally of the passages are one or more plenum chambers fed at the bottom with leakage gas from the central cushion to form an auxiliary cushion. The plenum chambers may also be supplied directly at their upper ends with gas. The gas passages are formed by an inclined outer wall and a plurality of wall elements facing the outer wall and which are spaced and overlapped to permit gas within the central cushion to recirculate into the gas flowing in the passages.

3,791,479

DEVICE FOR EMITTING AND RECEIVING SIGNALS IN A BORE HOLE, ELIMINATING THE INFLUENCE ON THE INTENSITY OF THE SIGNALS BEING RECEIVED OF THE SHAPE OF THE HOLE AND OF A CENTERING DEFECT OF THE DEVICE IN THE LATTER

Francisque Lebreton, Paris; Jean-Paul Sarda, Rueil-Malmaison, and Pierre Morlier, Paris, all of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants 1 & 4, Rueil-Malmaison, France

Filed Oct. 1, 1971, Ser. No. 185,712
Claims priority, application France, Oct. 1, 1970, 7035618
Int. Cl. G01v
U.S. Cl. 181—.5 BE 10 Claims



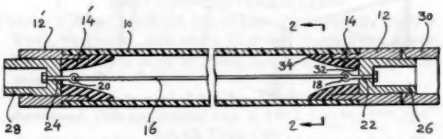
A device for emitting and receiving signals in a bore hole with a view toward determining the characteristics of the geological formations surrounding the hole including at least one emitter and one receiver, and a support arrangement for the emitter and receiver formed by interconnected elastic support elements having a ring-shaped configuration which is capable of supporting the emitter and receiver one below the other essentially in the same diametrical plane of the hole on respective sides of the axis of the hole and in proximity to the wall of the hole at essentially predetermined equal distances from that wall.

3,791,480

STRESS RELIEF INSERT FOR FLEXIBLE TOWED ARRAY

Walter L. Clearwaters, Quaker Hill, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 13, 1972, Ser. No. 297,579
Int. Cl. G01v 1/16
U.S. Cl. 181—.5 A 5 Claims

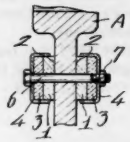


A stress relief insert of a generally cylindrical shape having a small inner diameter at one end and tapering out to a larger inner diameter at the other end. The insert is made of a flexible material and is positioned between one end of a flexible boot and a rigid end piece in a flexible towed array. The end having the smallest inner diameter is in contact with the rigid end piece of the towed array and the other end of the insert is in contact with the flexible boot over a length of the inner wall of the boot.

3,791,481
ECHO-NOISE ABSORPTION DEVICE

Hitoshi Yazaki, 12-6 Minami Aoyama 4-chome, Minato-ku, Tokyo, Japan

Filed July 25, 1973, Ser. No. 382,594
Int. Cl. E04b *1/84*
U.S. Cl. 181—33 R 14 Claims

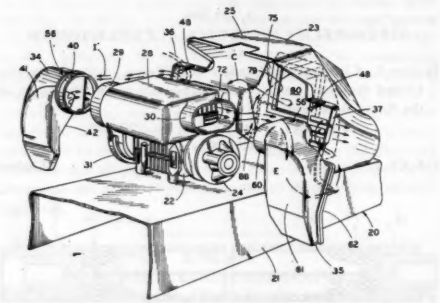


An echo-noise absorption device for absorbing echo-noise which is generated from a moving metal machine part or transmitted from said moving machine metal part through another stationary machine metal part comprising at least one echo noise absorption unit which includes a soft metal echo-noise absorption element having one face to be applied to the adjacent surface of said moving machine metal part or stationary metal machine part; a non-metal anti-noise transmission element in contact with the face of said soft metal element opposite to said machine part contact face; a cup-shaped cover surrounding the entire periphery and the face of said non-metal element opposite to said soft metal element and portion of the periphery of said metal element; and a fastening means extending through said soft metal and non-metal elements and cover so as to fixedly secure the elements and cover together to said moving or stationary machine part.

3,791,482
NOISE SUPRESSION AIR DUCT ASSEMBLY FOR AIR COOLED INTERNAL COMBUSTION ENGINES IN VEHICLE INSTALLATIONS

Hans Werner Sykora, Drummondville, Quebec, Canada, assignor to The Coleman Company, Inc., Wichita, Kans.

Filed May 14, 1973, Ser. No. 360,337
Int. Cl. F01m *1/00*
U.S. Cl. 181—35 R 12 Claims

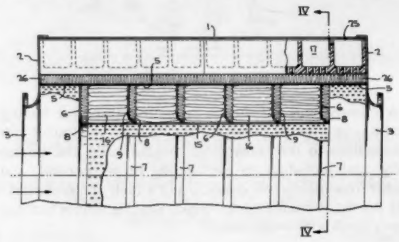


The noise emitted by an air cooled internal combustion engine in a vehicle installation is suppressed by an air duct assembly which is light weight and easily removable to permit access to the engine and related components for routine adjustments and servicing. The duct assembly includes relatively rigid air intake and air exhaust ducts, each of which is integrally molded from plastic with sound absorbing qualities. For axial fan cooled engines, the fan and cylinder cooling fins are enclosed by a shroud provided with air intake and exhaust openings. The cowl of the vehicle which encloses the engine is also provided with air intake and exhaust openings. The intake duct extends between the air intake opening of the vehicle cowl and the air intake opening in the engine shroud, and the exhaust duct extends between the exhaust opening of the engine shroud and the exhaust opening in the vehicle cowl. Each duct provides a baffled or tortuous air passage so that noise cannot escape through the duct without being reflected from the walls of the duct, and each duct is removably secured to either the engine shroud or the cowl by spring latches which permit quick removal of the ducts when desired. The duct assembly also supplies combustion air through a baffled path to a carburetor plenum chamber.

3,791,483
SOUND ABSORBER

Costa Silard Vasiljevic, Hausserstrasse 114, Tubingen, Germany

Filed June 19, 1972, Ser. No. 264,209
Claims priority, application Germany, June 24, 1971, 2131410
Int. Cl. F01n *1/04*
U.S. Cl. 181—42 16 Claims

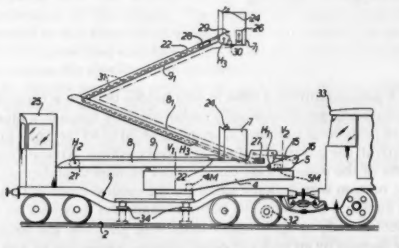


A sound absorber, especially for aerodynamic installations, comprising a tubular-like housing closed at each end by a cover member, each said cover member leaving free a central throughpassage opening. Two dampening systems are housed within the housing, one such dampening system extending as a longitudinal dampening device over the housing inner wall, the other dampening system being formed by partition walls located perpendicular to the throughflow direction and distributed over the length of the housing. These partition walls only cover a part of the internal compartment of the housing left free by the longitudinal dampening device.

3,791,484
MOBILE PLATFORM CARRYING MACHINE

John M. Harrison, Corner Cottage, Gwithian, Hayle, Cornwall, England

Filed Sept. 14, 1971, Ser. No. 180,393
Claims priority, application Great Britain, Sept. 15, 1970, 43,920/70
Int. Cl. B66f *11/04*
U.S. Cl. 182—2 14 Claims



A platform carrying machine, particularly useful for viaduct inspection, is mounted on a carriage and includes a platform-

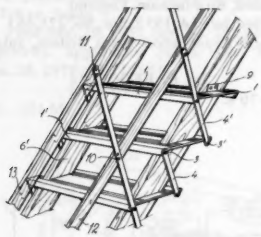
carrying boom structure mounted on the end of a horizontal support arm which can be swung laterally outwardly from the carriage. The boom structure is arranged to elevate and/or depress the platform relative to the carriage to inspect areas above and below the level of the carriage, the platform having a range of horizontal movement allowing the platform to enter, for example, a viaduct arch beneath the carriage. The entire boom structure can in addition be slewed about a vertical axis at the end of the lateral support arm to further increase the range of positions of the platform.

3,791,485

MOUNTABLE STAIRCASE, LADDER OR THE LIKE

Lars Ake Wilhelm Norlander, 9 Skogsliden, Stocksund, Sweden

Filed Oct. 20, 1971, Ser. No. 190,707
Int. Cl. E06c *1/38*
U.S. Cl. 182—106 **6 Claims**



A mountable staircase or ladder comprises at least two elongated beams and a plurality of treads, which are pivotally connected to each other by means of links, adapted at the ends of the treads and connecting the front portion of one tread with the rear portion of an adjacent tread, at least some of said links having extended portions, serving as support posts for arm rests and said treads being also provided near their ends with openings for the beams, said openings having a dimension in the length direction of the tread, which is approximately equal to the corresponding dimension of the beam, its dimension prependicular thereto however exceeding the corresponding dimension of the beam. At least the extended link portions are preferably removable and may be shifted from one side of the ladder to the other.

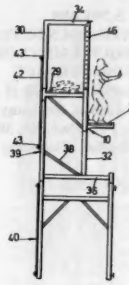
3,791,486

SCAFFOLDING

Robert Haldane Marnoch, P.O. Box 270, Mobeni, Natal, Westville, South Africa

Filed Apr. 24, 1972, Ser. No. 246,816
Claims priority, application South Africa, Apr. 28, 1971, 71/2740
Int. Cl. E04g *1/18*
U.S. Cl. 182—132 **2 Claims**

The invention relates to a scaffold arrangement having stepped elements, the horizontal portions of which constitute supports for a work platform and a materials platform, the vertical portions of the stepped elements being pipes slidable over and releasably securable to one of a pair of vertical poles, the rears of the materials platform supports having sleeves slidable



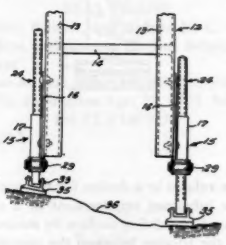
on the other of the pair of vertical poles, the vertical poles being included in a framework.

3,791,487

RAIL EXTENSION DEVICE FOR LADDERS

Arthur V. Baumann, 1410 Wynneburne Dr., Cincinnati, Ohio

Filed Apr. 20, 1973, Ser. No. 353,206
Int. Cl. E06c *7/44*
U.S. Cl. 182—201 **5 Claims**



An extension device attachable to the side rails of ladders that is adjustable to maintain the ladders in vertical positions upon uneven supporting surfaces, said device being readily manipulated to the desired rail extended condition and adapted to retain that condition when the ladder is set up or when the ladder is moved from one place to another.

3,791,488

LUBRICANT AND CLEANING COMPOSITION FOR PRECISION INSTRUMENTS

Charles S. Rowe, deceased, late of Lake Park, Fla. (by Doris D. Rowe, executrix), and Alvin C. Pyles, North Palm Beach, Fla., assignors to Doris D. Rowe, Lake Park, Fla., a part interest

Continuation-in-part of Ser. No. 34,597, May 4, 1970, abandoned. This application Aug. 2, 1972, Ser. No. 277,257
Int. Cl. F16n *1/00*
U.S. Cl. 184—1 E **17 Claims**

Complex-mechanisms, such as timepieces, can be lubricated in their assembled condition according to a process which comprises immersing the mechanism in a first solution comprising a solvent and a highly refined mineral oil, subjecting the solution and the mechanism to agitation, removing the mechanism and spinning-off excess solution therefrom, immersing the mechanism in a second composition comprising a solvent, a highly refined mineral oil and a siloxane polymer having a viscosity from 500–1,500 centistokes, subjecting the composition and the mechanism to agitation, removing the

mechanism from the composition, spinning-off excess composition therefrom and thoroughly drying same.

3,791,489

DEVICE FOR THE CONTINUOUS DETERMINATION OF THE LUBRICANT REQUIREMENT OF A MOVABLE SLIDING SURFACE

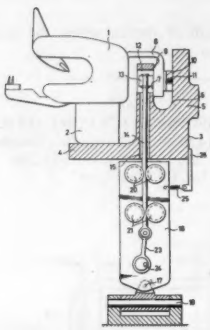
Julius Vernazza, and Oskar Marx, both of Aachen, Germany, assignors to H. Krantz, Aachen, Germany

Filed Oct. 24, 1972, Ser. No. 300,194

Claims priority, application Germany, Oct. 26, 1971, 2153173

Int. Cl. F16n *1/00*

U.S. Cl. 184—5 **11 Claims**



This invention relates to a device for the continuous determination of the lubricant requirement of a sliding surface movable against a fixed sliding surface by measuring the force for overcoming the friction between the movable sliding surface and a reciprocating sensor member urged against the sliding surface with the constant contact pressure, said device comprising a supporting bar slidably mounted on a support plate, said supporting bar mounting a sensor member at one end and having its other end connected by a crank rod to an eccentric drive, the plate carrying a motor to actuate the eccentric drive to reciprocate the supporting bar. The end of the plate adjacent the eccentric is pivotally mounted on a first axis parallel to the movable sliding surface and on a second axis perpendicular to the movable sliding surface, a first resilient means reacting against the plate to urge said sensor member against the movable sliding surface and a second resilient means reacting against the plate to urge said sensor member in direction opposed to the direction of movement of the movable sliding member, means being provided actuated by movement of the sensor a predetermined amount in the direction of movement of the movable sliding surface to actuate lubricating means for such movable sliding surface.

3,791,490

ELEVATOR CONTROL SYSTEM FOR INDICATING DAMAGE TO AN ELEVATOR STRUCTURE

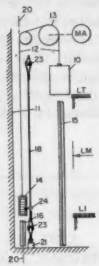
Don Francis Smith, Novato, Calif., assignor to Otis Elevator Company, New York, N.Y.

Filed Feb. 22, 1973, Ser. No. 334,538

Int. Cl. B66b *5/02*

U.S. Cl. 187—29 R **10 Claims**

An elevator control arrangement for detecting the physical displacement of one of the system's movable components from its normal operating position and thereafter restraining further movement of the car to a direction in which such



movement increases the physical separation of the car from its counterweight.

3,791,491

RAILWAY BRAKES

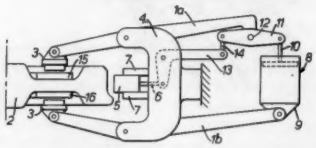
Colin John Frederick Tickle, Tyseley, England, assignor to Girling Limited, Birmingham, England

Filed July 14, 1972, Ser. No. 271,663

Claims priority, application Great Britain, July 16, 1971, 33,511/71

Int. Cl. B61h *11/14*

U.S. Cl. 188—70 R **7 Claims**



A railway vehicle brake arrangement comprises a disc brake and a tread brake, both associated with one and the same wheel and axle set, and a power actuator. Tee disc brake has a pair of caliper levers carrying respective brake shoes, and the actuator is operative to actuate the caliper levers to apply the brakes shoes. The actuator is mechanically coupled indirectly to one of the caliper levers through an equalizing lever which forms part of the transmission to the tread brake.

3,791,492

CALIPER BRAKE

William Neilsen, Seattle, Wash., assignor to Hydrostatic Technology, Inc., Seattle, Wash.

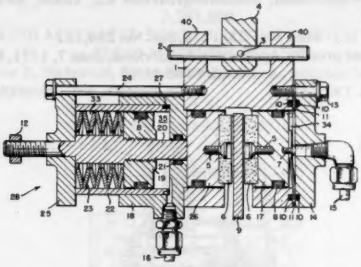
Filed May 30, 1972, Ser. No. 257,922

Int. Cl. F16d *65/24*

U.S. Cl. 188—170 **5 Claims**

A brake mechanism for use in conjunction with a rotatable disk including a pad adapted to selectively contact each side of the disk during the braking operation. The pads are independently controlled and one pad is caused to frictionally engage the disk to selective application of a fluid pressure whereas the second pad is adapted to frictionally contact the disk by means of spring pressure which is enacted upon the happening of the predetermined condition. The mechanism is mounted relative to the disk such that the engagement of either of the pads causes the brake mechanism to move axially of the disk such that the disk is engaged from both sides. The fluid operated pad is retained in a non-engaging position by a spring means whereas the spring operated pad is retained in the non-engaging position by a fluid pressure such that a

decrease in pressure will cause the pad to engage the disk thus stopping the disk. The mechanism further includes a manual



means for compressing the spring in the absence of fluid pressure.

3,791,493

FRICTION ELEMENTS FOR BRAKING ROTARY BODIES

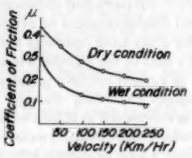
Motosaburo Yamaguchi, and Matsuo Takahashi, both of Yokohama, Japan, assignors to Nippon Carbon Company, Limited, Tokyo, Japan

Filed Nov. 29, 1971, Ser. No. 202,857

Claims priority, application Japan, Dec. 5, 1970, 45-107190; Dec. 25, 1970, 45-118141

Int. Cl. F16d *69/02*

U.S. Cl. 188—251 M **10 Claims**



Friction elements for braking rotary bodies, such as wheels in railway cars, electric cars and motorcars, contains 50 – 100% by weight of aluminum and said elements may be aluminum alloys or aluminum compositions. These elements may be used alone by directly sliding on a wheel or together with a conventional brake, or for a brake shoe in a disc brake.

3,791,494

TEMPERATURE COMPENSATING MEANS FOR A HYDRAULIC SHOCK ABSORBER

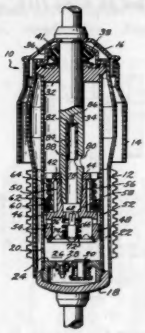
Sellers B. McNally, Homewood, Ill., assignor to Maremont Corporation, Chicago, Ill.

Filed Mar. 11, 1971, Ser. No. 123,330

Int. Cl. F16f *9/52*

U.S. Cl. 188—277 **7 Claims**

A hydraulic shock absorber having a working chamber, a piston slidably disposed in the working chamber and having a piston rod attached thereto extending outwardly of the chamber; a fluid passage is formed through the piston and is in fluid communication with an axial bore formed in the piston rod; a radial bore is provided in the piston rod to establish fluid communication with the axial bore so that, when the piston moves through a rebound stroke hydraulic fluid may flow from one side of the piston to the other through the radial bore and axial bore of the piston rod and through the fluid passage formed in the piston; an elongated element made of a material having a coefficient of thermal expansion that is greater than the material from which the piston rod is made is disposed in the axial bore of the piston rod and has one end thereof fixedly attached to the portion of the piston rod defining the inner end of the axial bore and the other end thereof disposed in a flow restricting relation with respect to the radial



bore which varies in response to temperature changes of the hydraulic fluid whereby substantially constant damping effect is provided over a range of temperature variations.

3,791,495

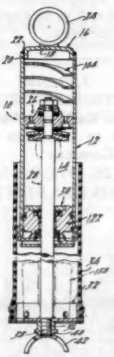
SHOCK ABSORBER WITH PISTON ROD GUIDE AND SEAL MEANS

Johan H. Keijzer, Hasselt, and Roland H. C. Beets, Truiden, both of Belgium, assignors to Monroe Belgium N.V., St. Truiden, Belgium

Continuation-in-part of Ser. No. 45,867, June 12, 1970, abandoned. This application Apr. 21, 1971, Ser. No. 136,061

Int. Cl. F16f *9/36*

U.S. Cl. 188—322 **3 Claims**



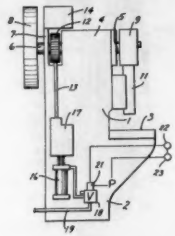
A shock absorber comprising an elongated cylindrical pressure cylinder having a piston reciprocally disposed therewithin and connected to a piston rod extending outwardly from one end thereof. The pressure cylinder is adapted to be filled with preselected quantities of a hydraulic damping fluid and a pressurized gas for damping reciprocal movement of the piston therewithin. One end of the pressure cylinder is provided with a novel rod guide assembly which is designed so as to permit the use of extremely economical materials without any sacrificing of sealing efficiency.

3,791,496

DUAL CONTROL ADAPTER FOR PRESS

Homer R. Emrick, Kalamazoo, Mich., assignor to Emrick, Inc., Kalamazoo, Mich.

Filed Aug. 17, 1972, Ser. No. 281,491
Int. Cl. F16p 3/18
U.S. Cl. 192—22 7 Claims



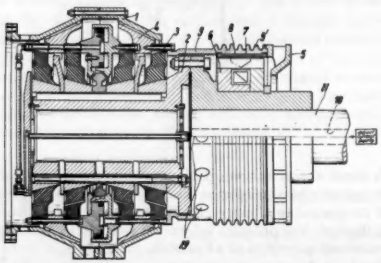
Safety actuating device for a press. In a press, as a punch press, having a one-way clutch and a rod responsive to actuating means for operating said clutch to control the press, there is provided means interposed between actuating means and said rod to insure that the press will operate only in response to a force occurring in a predetermined manner and place. The rod is connected to a pivotally mounted lever whose operation is first resisted and then effected by successive operation of two linkages responding to energizing of a pressure cylinder. One linkage first, and normally, provides support means under said lever for positively preventing it from effecting movement of said rod. A pair of hand switches are each connected to a valve for energizing the cylinder when both of the operator's hands are on the respective switches. With the device of the invention in place and the actuating cylinder energized, the first operation is to pull the support means out of locking position and thereby to permit downward movement of said lever. This is followed immediately by engagement of said lever by said second linkage which draws the ever downward sufficiently to effect such movement of said pull rod as to energize the clutch and initiate one operation of the press.

3,791,497

ELASTIC SHAFT CLUTCH

Erwin Fleischmann, and Karlheinz Watzlawek, both of Witten, Germany, assignors to Lohmann & Stolterfoht Aktiengesellschaft, Witten, Germany

Filed July 28, 1972, Ser. No. 275,917
Int. Cl. H02k 5/24; F16d 13/26, 3/68
U.S. Cl. 192—30 V 5 Claims



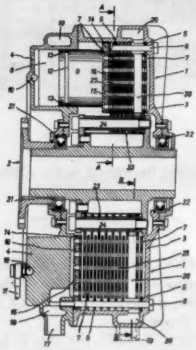
Elastic clutches and couplings are disclosed in which the elastic components are bridged by a concentric coil-armature arrangement for attenuating oscillations between these parts which should rotate in unison.

3,791,498

DEVICE FOR THE FRICTIONAL INTERCONNECTION OF TWO STRUCTURAL PARTS

Hans Wassermann, Sonnenhugelstrasse 62, Arbon, Switzerland

Filed May 23, 1972, Ser. No. 256,181
Claims priority, application Switzerland, June 7, 1971, 8302
Int. Cl. F16d 25/00
U.S. Cl. 192—57 5 Claims



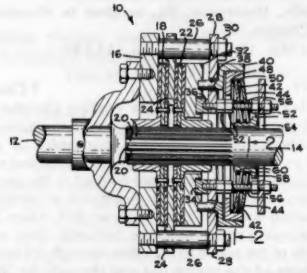
The device is used for the frictional interconnection of two structural parts at least one of which is rotatable about an axis, and includes a plurality of substantially parallel disks coaxial with this axis and connected non-rotatably and in alternation to the respective structural parts and displaceable axially to effect engagement and disengagement of axially adjacent disks with each other. The disks have openings therethrough so arranged that at least a part of the openings in all the disks coincide at least partly in certain relative angular positions of the parts to form passages extending through the assembly of disks. An impeller is connected to rotate with a rotatable part, and circulates a working fluid, such as a cooling fluid, through these passages so that a hydrodynamic interconnection and a frictional interconnection of the two parts may be effected. The device is usable either as a truck brake or as a clutch.

3,791,499

CLUTCH

Joseph J. Ryan, 15325 Norton Rd., Saratoga, Calif.

Filed Jan. 3, 1972, Ser. No. 214,557
Int. Cl. F16d 13/56
U.S. Cl. 192—70.27 2 Claims



A clutch for transferring torque from an input to an output shaft which includes input and output clutch elements connected respectively to said shafts for rotation therewith and spring means for urging said clutch elements together includ-

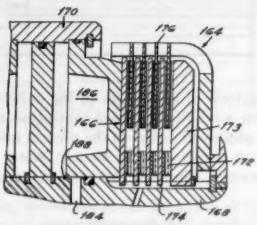
ing a pair of spring diaphragms arranged in adjacent relation whereby the summation of their resilient forces is realized.

3,791,500

FLUID ACTIVATED DOUBLE-ACTING CLUTCH WITH FLUID METERING MEANS

Oscar E. Stefanutti, Bloomfield Hills, Mich., assignor to D.A.B. Industries, Inc., Detroit, Mich.

Filed Apr. 5, 1972, Ser. No. 241,335
Int. Cl. F16d *25/10*
U.S. Cl. 192—87.17 **3 Claims**



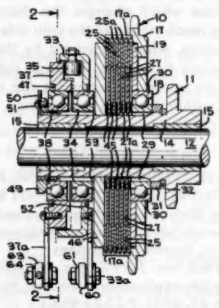
The clutch is a double-acting device which includes a shaft having a pair of spaced apart first clutch plate assemblies carried thereon. A second pair of clutch plate assemblies are carried by a pair of drive members which are rotatably mounted on the shaft. The second pair of clutch plate assemblies are placed in operative relationship to the first pair of clutch plate assemblies. Hydraulic power means are provided between the pairs of clutch plate assemblies to compress one or the other to cause frictional engagement of the plates to thereby provide a driving connection therebetween. Spring means are provided to urge either the clutch plates or the hydraulic power means to a neutral position upon relief of hydraulic pressure.

3,791,501

CAM OPERATED CLUTCH

George W. Culbertson, Oconomowoc, Wis., assignor to FMC Corporation, San Jose, Calif.

Filed Mar. 14, 1972, Ser. No. 234,558
Int. Cl. F16d *23/12*
U.S. Cl. 192—93 A **2 Claims**



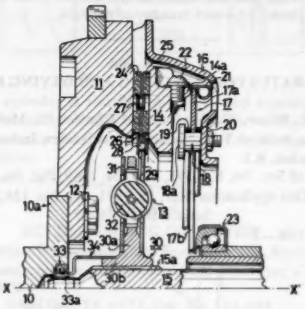
The clutch of the present invention is of the type wherein friction rings associated with a drive member are forced into face-to-face engagement with friction-discs splined to a driven member. The engagement of the friction member is effected by a cam and cam follower mechanism.

3,791,502

CLUTCH WITH WEAR COMPENSATING RELEASING SPRING

Mototaka Nakane, Hekinan, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Karuja, Aichi pref., Japan

Filed Feb. 23, 1972, Ser. No. 228,665
Claims priority, application Japan, Feb. 23, 1971, 46/008782
Int. Cl. F16d *13/75*
U.S. Cl. 192—111 A **5 Claims**



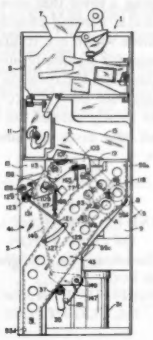
The invention relates to a vehicle clutch releasing mechanism including a releasing means made of ductile material having both ranges of elastic and plastic deformation and being assembled resiliently and immovably in an axial direction in the clutch engaging state and adapted for positively serving as a pusher of the clutch disc assembly during clutch releasing operation and for compensating wearing amount of clutch facing elements of the clutch disc assembly by its plastic deformation when clutch facing elements wear and for keeping its elastic thrust energy constant, and for limiting the returning of the clutch disc assembly to a constant amount.

3,791,503

COIN APPARATUS

Harry C. Haeusser, St. Louis County, and Barry L. Smith, Florissant, both of Mo., assignors to UMC Industries, Inc., St. Louis, Mo.

Filed July 1, 1970, Ser. No. 51,570
Int. Cl. G07f *15/08*
U.S. Cl. 194—1 G **4 Claims**



Conversion of a coin mechanism which, per se, is limited to handling nickels, dimes and quarters, and limited to controlling vending at 5-cent prices (i.e., 10, 15, 20 cents etc.), so that it may handle pennies and control vending at 1-cent

prices (i.e., 11, 12, 13, 14, 16, 17 cents etc.). The conversion involves the provision of means for actuating the credit register of the coin mechanism through its basic 5-cent interval in response to deposit of a number of pennies corresponding to a predetermined 1-cent price minus the five-cent price next below (e.g., two pennies in the case of a price of 12 cents, three pennies in the case of a price of 13 cents), so that, by setting the coin mechanism at the 5-cent price next above (e.g., 15 cents in the case of a price of 12 or 13 cents), items may be vended at the predetermined penny price due to the registration of 5 cents by the credit register in response to the deposit of an amount equal to the 5-cent price next below (e.g., 10 cents) plus said number of pennies.

3,791,504

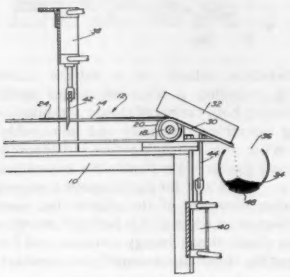
APPARATUS FOR HANDLING AND DRYING PENCIL LEADS

Verlon E. Wiser, Shelbyville, and Charles W. McCallie, Bell Buckle, both of Tenn., assignors to Hasbro Industries, Inc., Pawtucket, R.I.

Division of Ser. No. 879,381, Nov. 24, 1969, Pat. No. 3,586,298. This application Mar. 15, 1971, Ser. No. 124,536

Int. Cl. B65g *35/00*

U.S. Cl. 198—1 **7 Claims**



Apparatus for handling and drying pencil leads comprising means for receiving the leads after extrusion and cutting thereof but while the leads are still moisture laden and hence limp and easily deformable, said means maintaining the leads in straightened condition while loading the leads into cylindrical cans, the loaded can being rotatable about their own axes to maintain the leads therein in straightened condition, the apparatus further comprising a rotary furnace for receiving the loaded cylindrical cans to effect drying of the leads, said rotary furnace comprising a rotor that slowly moves the loaded cans through an annular heating chamber, the loaded cans being mounted on discs which are rotatably mounted on the rotor, and drive means for simultaneously imparting rotation to the rotor and to the discs, the rotation of the latter being at a substantially greater rate than the rotation of the former, whereby as the rotor slowly carries the loaded cans through the heating chamber, the discs are simultaneously rotating about their own axes.

3,791,505

SOLID STATE VEND CONTROL MEANS AND PROCESS OF OPERATION

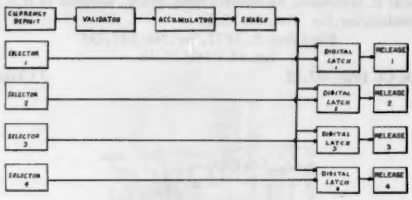
Darla R. Mandell, Houston, Tex., assignor to Marrick Industries Inc., Houston, Tex.

Filed June 14, 1972, Ser. No. 262,500

Int. Cl. G07f *11/00*

U.S. Cl. 194—10 **13 Claims**

This apparatus is a modular solid state system for operating vending machines, which will contribute little to the bulk of the machines and allow either more space for the vended goods in the machine or allow design of smaller and more compact vending machines than contemplated in the prior art. Other advantages of the present invention are lower cost of manufacture than the cumbersome mechanical equivalents of the prior art and simple repair. Repair should be less frequent by the use of the solid state system described. Basically, the apparatus has a currency desposit, currency evaluator, a solid



state accumulator to keep track of the currency deposit, an enable means, a solid state release control means and a release means. An additional aspect of the present invention lies in a release means which uses an electric motor having an extended armature which rotates and releases items to be vended.

3,791,506

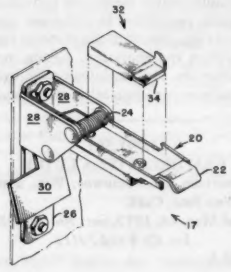
COIN ADJUSTING MECHANISM FOR NEWSPAPER DISPENSERS

Robert F. Wise, 4518 Colby St., Everett, Wash.

Filed Nov. 29, 1971, Ser. No. 202,780

Int. Cl. G07f *17/14*

U.S. Cl. 194—71 **6 Claims**



A latch adjusting mechanism for use in a coin operated vending machine which changes the distance between the latch operating mechanism and the coin detecting mechanism. The denomination, which measured by the combination of coins, is necessary to operate the latch may be quickly and easily altered by adding or removing the mechanism which may be stored within the vending machine.

3,791,507

APPARATUS FOR MANIPULATING FILTER ROD SECTIONS OF MULTIPLE UNIT LENGTH

Heinz Kaeding; Heinz Fick, both of Geesthacht, and Rolf Dahlgruen, Tornesch, all of Germany, assignors to Hauni Werke Korber & Co., Hamburg, Germany

Filed Nov. 2, 1972, Ser. No. 303,217

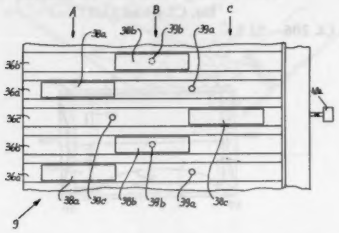
Claims priority, application Germany, Nov. 26, 1971, P 21 58 686.7; May 17, 1972, P 22 23 883.1

Int. Cl. B65g *47/26*

U.S. Cl. 198—32 **16 Claims**

A filter cigarette making machine wherein the shuffling conveyor which converts three discrete files of filter rod sections of double unit length into a single file while the filter rod sections move sideways has a drum-shaped body with axially parallel peripheral flutes for reception of discrete files of filter

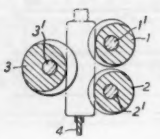
rod sections from a staggering conveyor in such a way that each flute receives a single filter rod section. At least some of the flutes are in communication with suction ports which draw from the flutes currents of air in such a way that the filter rod sections in the respective flutes move axially into register with the remaining filter rod sections. The pneumatic axial shifting of filter rod sections is particularly desirable in connection with moist filter rod sections which offer considerable resistance to sliding movement under the action of cams, rollers or belts. The staggering conveyor has circumferentially extending recesses of different width which receive discrete filter rod sections of successive rows of axially parallel sections and which cooperate with a stationary rolling device to roll selected filter rod sections of each row rearwardly during sidewise movement of filter rod sections so that the rows of filter rod sections are converted into discrete files which are ready to be transferred onto the shuffling conveyor.



3,791,508
WORM CONVEYORS

Michael Bryon Osborne, and Allan James Birch, both of Hull, England, assignors to Kingston Conveyors Limited, Hull, England

Filed Nov. 20, 1972, Ser. No. 307,992
Int. Cl. B65g *47/26*
U.S. Cl. 198—34 A **2 Claims**



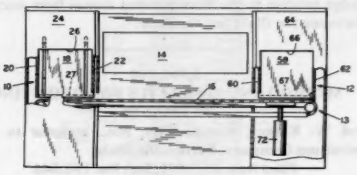
A conveyor for moving articles along on a rail or other smooth surface comprising two superposed worms with a third worm with its axis symmetrically spaced from the axes of the other two worms, the worms being formed as helical grooves with like root diameters in rubber or plastics material on metal shafts which in use are driven at the same speed.

3,791,509
MAGNETIC HOPPER SYSTEM FOR LOADING AND UNLOADING A CONVEYOR

Alan Richardson Jones, Miami, Fla., assignor to Coulter Chemistry, Inc., Maunabo, P.R.

Filed Nov. 3, 1971, Ser. No. 195,363
Int. Cl. B65g *17/46, 57/30, 59/06*
U.S. Cl. 198—41 **25 Claims**

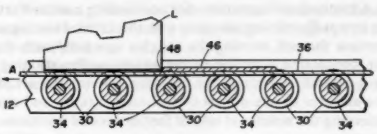
The system includes a first magnetic plate mounted in a generally upright position at a first location adjacent a conveyor and adapted to hold thereagainst a plurality of objects each having a magnetizable material therein. The plate has two slots therein and a movable finger in each slot which is adapted to engage the top side of the object for sequentially moving objects downwardly onto the conveyor. A second magnetic plate is mounted in a generally upright position at a second location downstream from the first location and adjacent the conveyor. A vertically reciprocal ram powered by a pneumatic cylinder is situated at the second location and is adapted to move upwardly to sequentially move objects from the conveyor onto the second plate as each object reaches the second location.



3,791,510
ACCUMULATING CONVEYOR

Carl J. Milazzo, Tonawanda, and Frank J. Hohl, Snyder, both of N.Y., assignors to Hohl Machine & Conveyor Co., Inc., Buffalo, N.Y.

Filed Dec. 23, 1971, Ser. No. 211,351
Int. Cl. B65g *13/02*
U.S. Cl. 198—127 R **7 Claims**

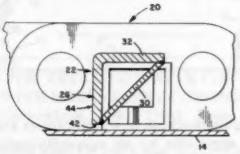


A series of live rollers have reduced diameter portions centrally thereof forming grooves receiving and guiding an endless drive member having one side in frictional contact therewith. The drive member thickness is less than the roller groove depth and spaced pads on the drive member project slightly above the article engaging surfaces of the rollers to engage the trailing edge of a stationary load and initiate forward movement thereof.

3,791,511
CONVEYOR SYSTEM

John H. Holland, Cleveland, Okla., assignor to Arkansas Rock and Gravel Co., Mufreesboro, Ark.

Continuation-in-part of Ser. No. 81,794, Oct. 19, 1970, abandoned. This application Dec. 10, 1971, Ser. No. 206,634
Int. Cl. B65g *19/10, 45/00*
U.S. Cl. 198—172 **18 Claims**



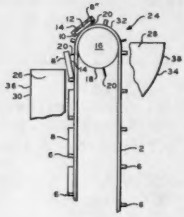
A conveyor system for asphalt, concrete, aggregate and similar materials includes a plurality of conveyor flights and a pair of chains for moving the flights along a material supporting floor. Each flight includes end portions which attach the flight to the chains and a central portion having a hollow trian-

gular cross section that extends substantially across the floor to define a narrow edge at the lower leading portion of the flight. The end portions support each flight with the narrow edge of the central portion facing and spaced from the floor. By this means the narrow edge and the spaced positioning of the edge relative to the floor prevent stones from accumulating between the flight and the floor.

3,791,512
METHOD AND APPARATUS FOR ORIENTING ELEMENTS

Alfred W. Kinney, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 15, 1971, Ser. No. 198,646
Int. Cl. B65g *47/24*
U.S. Cl. 198—33 AA **14 Claims**

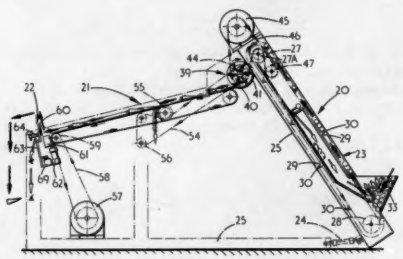


A method and apparatus for positioning concave articles on an upwardly moving elevator with the articles resting on a side portion thereof, moving the articles upwardly with the elevator, contacting a portion of the articles with a rotating protrusion extending through the elevator, moving the articles from the elevator to one of first or second locations, and commonly orienting the articles at one of first or second locations.

3,791,513
DELIVERY APPARATUS

Colin Barlow, Radcliffe, England, assignor to Mather & Platt Limited, Lancashire, England

Filed July 21, 1972, Ser. No. 273,909
Claims priority, application Great Britain, July 21, 1971, 34,139/71
Int. Cl. B65g *47/24*
U.S. Cl. 198—33 AA **3 Claims**

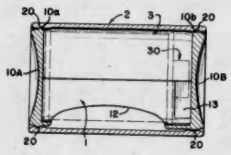


A carrot topping machine in which carrots are delivered to an orientating apparatus by an upwardly-inclined elevator. The elevator has a box-like casing over which runs carrot-conveying flights carried by bars connected between conveying chains. A supply hopper is located adjacent the bottom of the elevator, the hopper permitting passage of the bars and flights to pick up carrots. Adjacent the top of the casing is an opening over which the flights pass so that excess carrots fall into the casing from which they are re-directed back to the hopper by chutes. Feed paddle wheels are located at the top of the elevator to receive the carrots and roll them on to the orientating apparatus.

3,791,514
CONTAINER FOR FILM MAGAZINE

Riki Watanabe, Tokyo, Japan, assignor to Q Designers Inc., Tokyo, Japan

Filed Jan. 24, 1972, Ser. No. 220,166
Int. Cl. B65d *85/67*
U.S. Cl. 206—52 F **4 Claims**

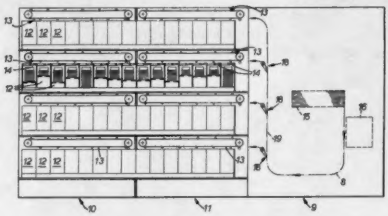


A film magazine container is composed of a single hollow member having opposed open ends and a slidable member inserted thereinto having opposed end plates fixed at the opposite ends thereof for serving as end covers of the hollow member. The slidable member is provided with an opening at the intermediate portion thereof and an abutment projection at an end thereof.

3,791,515
DOCUMENT SORTING AND HANDLING MACHINES

David Wood, Clevedon, England, assignor to Masson Scott Thrissell Engineering Limited, Bristol, England

Filed Nov. 6, 1972, Ser. No. 303,941
Int. Cl. B07c *3/06*
U.S. Cl. 209—73 **6 Claims**



A conveyor for carrying documents or envelopes comprising an endless flexible belt provided with spaced carriers in the form of metal rods with multiple bends moving along ribbed or grooved supporting surfaces, the belts being also formed with spaced teeth to engage toothed driving sprockets, so that the positions of the conveyed articles are accurately determined. Below the supporting surface sorting boxes are located each with a diverter gate movable into the path of the travelling articles, and a number of such conveyors are positioned end-to-end to transfer mail from one to the next.

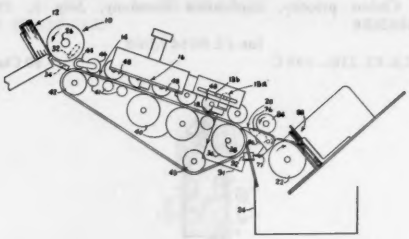
3,791,516
BATCH TICKET READER

Herbert Tramposch, Riverside, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Jan. 10, 1972, Ser. No. 216,536
Int. Cl. B07c *3/00*
U.S. Cl. 209—74 **12 Claims**

Ticket reading apparatus is disclosed having a moving grooved belt for transporting tickets fed singly thereto by separator rollers controlled by a clutch and brake in relation to information recording speed. Reading is accomplished by at

least two detectors spaced to read information along the length of the ticket regardless of end-for-end orientation. Each detector comprises a light source and photocell detector having a narrow rhombic aperture for optimum reading of



tickets oriented longitudinally on the belt or only slightly skewed. There is also provided a ticket routing gate assembly operated by a switch enabled by the information recorder to divert tickets to one of two routes and to stack tickets which have not been properly read.

3,791,517

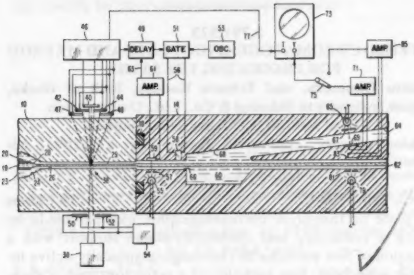
DIGITAL FLUIDIC AMPLIFIER PARTICLE SORTER

Mitchell Friedman, Yorktown Heights, N.Y., assignor to Bio/Physics Systems, Inc., Mahopac, N.Y.

Filed Mar. 5, 1973, Ser. No. 338,216

Int. Cl. B07c *5/00*

U.S. Cl. 209—74 R **20 Claims**



Differences in small particles entrained in a stream of liquid are detected and the resultant difference signals are used to control a fluidic amplifier located downstream to switch the liquid particle carrying stream to different outlet ports determined by the detection of particle differences.

3,791,518

SIDE TRANSFER SORTING CONVEYOR

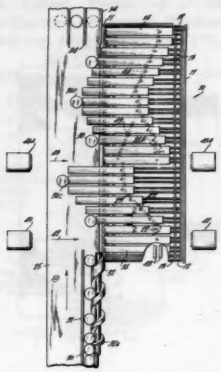
Frank B. Vanderhoof, Lake Forest, N.J., assignor to Metramatic Corp., Landing, N.J.

Filed Apr. 27, 1973, Ser. No. 355,000

Int. Cl. B07c *3/06*

U.S. Cl. 209—74 R **8 Claims**

A sorting conveyor having a plurality of movable plaques on one conveyor base arranged to sort merchandise or similar articles carried on another conveyor positioned at one side of the sorting conveyor. The separation of articles may be controlled by some particular property of the articles such as weight, size, or color, sensed in a known manner. The plaques on the sorting conveyor are activated to engage the articles



carried by the adjoining conveyor and change their relative position so that a series of fences can direct the reoriented articles into predetermined paths.

3,791,519

STORAGE APPARATUS

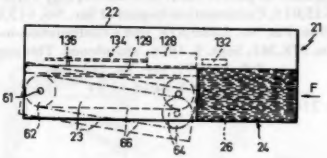
Herbert Weidanz, Odenthal-Globusch, and Gerhardt Sandt, Cologne, both of Germany, assignors to Datagraph A.G., Zug, Switzerland

Filed Sept. 29, 1972, Ser. No. 293,513

Claims priority, application Germany, Oct. 18, 1971, 2151752

Int. Cl. B07c

U.S. Cl. 209—80.5 **10 Claims**



Storage apparatus for the cycled selection of a sheet-like records carrier supported with other carriers in a cassette, in which means are provided to bring a chosen carrier in a protruding position in which it can be gripped and pulled out of the cassette by a first frame which transports the carrier to a fixed position. With the carrier in this fixed position reader stations can be positioned to read certain tracks on the carrier, while the carrier can be transported into the cassette from this fixed position.

3,791,520

PROCESS FOR TREATING WATER CONTAMINATED WITH HEXAVALENT CHROMIUM

Garmt J. Nieuwenhuis, 3601 197th Place S.E., Issaquah, Wash.

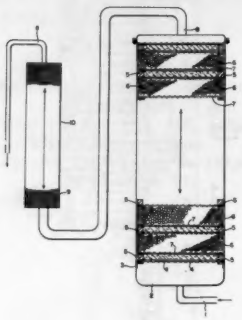
Filed Feb. 17, 1972, Ser. No. 227,099

Int. Cl. C02b *1/16*

U.S. Cl. 210—36 **9 Claims**

Water containing chromium anions in the parts per million range are removed by contacting the water-laden chromium solution with a water insoluble lead compound, such as lead oxide, lead carbonate or lead hydroxide, adsorbed in the pores

of an essentially inert, porous, particulate matrix such as vermiculite. The lead compound reacts with the chromium in the water to form insoluble lead chromate. The effluent may be



passed through an ion exchange column containing an acidic cation exchanger in the hydrogen form for removing any lead ion solubilized during passage through the bed of adsorbed lead compound.

3,791,521

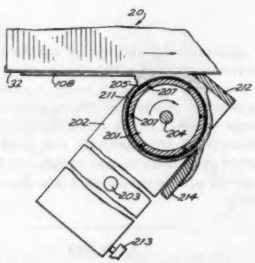
APPARATUS AND METHOD FOR CONTINUOUS FILTERING

William S. Eakins, St. Andrews Ln., Glen Cove, N.Y.

Continuation-in-part of Ser. No. 845,984, July 30, 1969, Pat. No. 3,615,011, Continuation-in-part of Ser. No. 613,691, Dec. 21, 1966, Pat. No. 3,460,674, and a continuation-in-part of Ser. No. 578,361, Sept. 9, 1966, abandoned. This application July 8, 1971, Ser. No. 160,746

Int. Cl. B01d *33/04*

U.S. Cl. 210—67 **6 Claims**



A traveling filter comprising a plurality of trays disposed to travel along a path, a plurality of frames adapted to travel along a second path and through a portion of said path mate with the trays to confine material thereon, and a plurality of conduit means adapted to travel along a third path and adapted to be advanced and retracted to establish communication with and discharge liquid from said trays.

3,791,522

CHROMATOGRAPHIC READY-FOR-USE COLUMNS

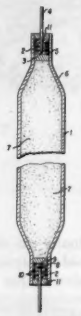
Friedhelm Eisenbeiss, and Susanne Ehlerding, both of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed June 20, 1972, Ser. No. 264,607

Claims priority, application Germany, July 1, 1971, 2132686

Int. Cl. B01d *15/08*

U.S. Cl. 210—198 C **10 Claims**



A ready-to-use chromatographic column packed with an adsorbent and both ends of which narrow into a shorter column having a smaller diameter into which is fitted a distributing filter, which is tightly packed against the adsorbent; a bored stopper, which is positioned against the distributing filter; and a capillary tube fitted in the bore of the stopper, one end of which extends beyond the end of the shorter column and the other in the interior of the bored stopper. These columns are convenient devices for adsorption and partition chromatography.

3,791,523

SINTERED CHROMATOGRAPHIC PLATE AND METHOD FOR PRODUCING THE SAME

Tamotsu Okumura, and Tetsuro Kadono, both of Osaka, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Nov. 30, 1972, Ser. No. 310,686

Claims priority, application Japan, Dec. 17, 1971, 46-102940

Int. Cl. B01d *15/08*

U.S. Cl. 210—198 C **14 Claims**

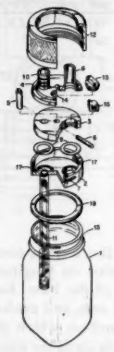
A plate or thin-layer chromatographic element made by coating a refractory and chemically-stable support with a dispersion of fine particles of chromagtographically-active inorganic adsorbent, fine particles of a refractory and acid-resistant fluorescent pigment of red luminescence and powdered fluorescent glasses of blue and green luminescences in a liquid dispersing medium, the mixing ratio of said fluorescent glasses and fluorescent pigment is so determined that the obtained mixture may have a blend of the luminescences of the three fundamental colors, that is, a pure-white luminescence upon excitation by means of an ultraviolet irradiation, removing the dispersing medium, and heating the coated layer to make it adherent and thereby to form a continuous, coherent and porous sintered-layer. Particles of the powdered glass contained in said sintered-layer hold a uniform distribution of the adsorbent particles and fluorescent pigment particles, and form firm bondings between each other and with the surface of the support without any detriment to the activity of the spots The element enables the discrimination between two contiguous spots of a chromatogram of colorless compounds to be discriminated, each of which has at least one absorption band in the ultraviolet region and the corresponding quenched emission on the thin-layer capable of emitting a pure-white luminescence in the absence of the chromatogram.

3,791,524

TISSUE COLLECTOR

Nakwon Cho, Knoxville, Tenn., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Apr. 13, 1972, Ser. No. 243,786
Int. Cl. B01d *35/02*
U.S. Cl. 210—232 1 Claim



A tissue collector is provided which is designed especially for obtaining a fetus in a sterile condition while permitting the removal of a specimen for pathological study. The collector is economical, compact and lends itself to transit. The collector can readily be cleaned and sterilized for reuse.

3,791,525

DEWAXING AND DEOILING APPARATUS

Robert E. Harris, and William R. Moseley, both of Beaumont, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 171,930, Aug. 16, 1971, Pat. No. 3,729,414. This application Dec. 22, 1972, Ser. No. 317,882
Int. Cl. B01d *33/02*
U.S. Cl. 210—217 3 Claims

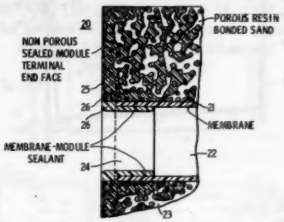
In a rotary filter dewaxing-deoiling process, the apparatus for improving the deoiling of the wax cake is described, characterized by utilizing a plurality of transverse solvent distributor pipes each of which dispense a relatively dense transverse curtain of solvent droplets on the wax cake thereby providing areas of solvent flooding interspaced with areas of considerably reduced solvent concentration.

3,791,526

SOLVENT WELD ADHESIVE FOR REVERSE OSMOSIS MEMBRANES

Regis R. Stana, Murrysville; Edward Mitchell, Wilkinsburg, and John B. Coffay, Media, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 10, 1971, Ser. No. 170,598
Int. Cl. B01d *31/00*
U.S. Cl. 210—321 4 Claims



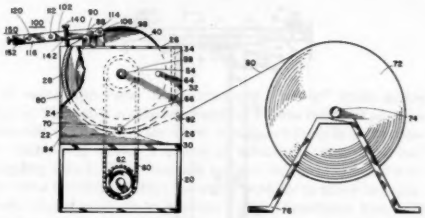
A method of sealing a reverse osmosis membrane to a contacting porous support comprises applying a sealant composition, comprising a cellulose ester, an organic solvent and an alcohol to the membrane and its contacting support.

3,791,527

ROTARY FILTER APPARATUS

Harry Ball, Piscataway, and Henry A. Steward, Califon, both of N.J., assignors to Technical Fabricators, Inc., Nutley, N.J.

Filed Oct. 21, 1971, Ser. No. 191,507. The portion of the term of this patent subsequent to Mar. 28, 1989, has been disclaimed.
Int. Cl. B01d *33/12*
U.S. Cl. 210—387 16 Claims



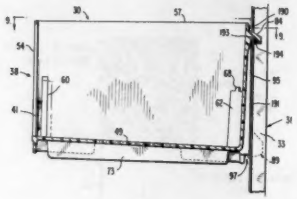
Rotary filter apparatus is provided with a rotary drum having a perforated peripheral wall extending into a tank containing slurry to be filtered. A sheet of filter paper is continuously fed from a source of supply to be wrapped around the drum with suction within the drum to draw the liquid from the slurry therethrough so that solids are filtered onto the paper. Between the paper and the drum a flexible endless screen is wrapped around with part of the screen being fed from the drum with the paper sheet attached thereto onto a guide device. This guide device acts to strip off the mesh screen and attached paper sheet with the solids thereon to carry the paper sheet away from the machine for disposal. The guide device includes stripping means with part thereof covering an exposed part of the peripheral wall to provide a seal for the suction.

3,791,528

ENCLOSURE STRUCTURE FOR MODULAR SYSTEM

Thomas Brendgord, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.

Filed Aug. 7, 1972, Ser. No. 278,362
Int. Cl. A47b 87/00; A47f 5/08
U.S. Cl. 211—88 22 Claims



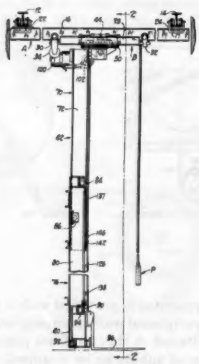
Unitary construction easy-access enclosure for handling, storing, transporting, and distributing articles throughout a modular system with self-seating and stabilizing interconnecting means for suspending the enclosure on an upright support, means for supporting the enclosure horizontally, and means for interlocked stable stacking of such enclosures. Means for dividing the enclosure internally and retaining carried articles, and dust cover means, are removably positioned by structural elements of the unitary-construction enclosures.

3,791,529

CRANE-TYPE STACKER

Roger V. Thomas, Willoughby Hills, Ohio, assignor to McNeil Corporation, Akron, Ohio

Continuation of Ser. No. 9,637, Feb. 9, 1970, abandoned. This application Oct. 26, 1971, Ser. No. 192,579
Int. Cl. B66c 19/00
U.S. Cl. 212—124 8 Claims



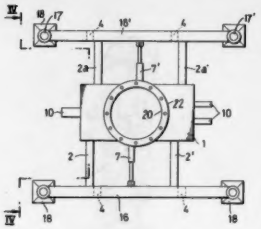
A material handling apparatus comprising a telescopic mast secured at its upper end to a movable overhead support and having a load carriage vertically movable along the lower movable mast section and interengaging means between the load carriage and the mast preventing movement of the load carriage upwardly along the lower mast section until the load carriage is raised to a position adjacent to or above the lower end of the upper fixed mast section.

3,791,530

ADJUSTABLE WIDTH CRANE SUPPORTING STRUCTURE

Richard Gorl, and Helmut Blase, both of Dortmund, Germany, assignors to Rheinstahl AG, Essen, Germany

Filed July 25, 1972, Ser. No. 274,904
Claims priority, application Germany, July 31, 1971, P 21 38 468.9
Int. Cl. B66c 23/62
U.S. Cl. 212—145 13 Claims



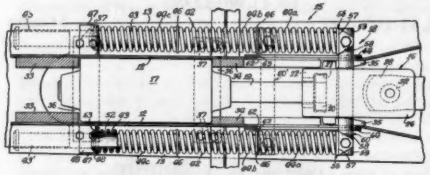
A device for supporting a crane comprises a crane mounting base which is supported on longitudinal support beams arranged on each side of the base. Each longitudinal support means carries at least one, and preferably two, longitudinally spaced transverse members which are in telescopic engagement with tubular portions of the mounting base and each longitudinal support beam includes an opening to permit the outer end of the transverse member which is secured to the opposite longitudinal support beam to pass therethrough in order to permit the two longitudinal support beams to be moved to a minimum width position in close proximity to the supporting base. The longitudinal support beams are movable inwardly and outwardly in respect to the support base by fluid pressure operated drive motors in the form of a fluid pressure cylinder and piston combination arranged on each side of the mounting base.

3,791,531

MOUNTING ARRANGEMENT FOR THE CUSHIONING UNIT RETURN SPRING ASSEMBLY OF AN END-OF-CAR RAILWAY CUSHIONING DEVICE

Vaughn T. Hawthorne, Mechanicsburg, Pa., assignor to Keystone Industries Inc., Chicago, Ill.

Filed May 22, 1972, Ser. No. 255,600
Int. Cl. B61g 9/16
U.S. Cl. 213—8 10 Claims



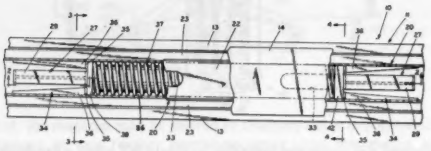
A mounting arrangement for the return spring assembly for the cushioning unit of an end-of-car railway cushioning device, wherein the return spring assembly includes a pair of elongated spring units respectively mounted adjacent the lateral side walls of the center sill of the associated railway car so that the spring units extend parallel to the longitudinal axis of the sill. The longitudinally inner ends of the spring units are connected to brackets mounted on the side walls of the sill and the longitudinally outer or forward ends of the spring units are respectively connected to the ends of a horizontally arranged

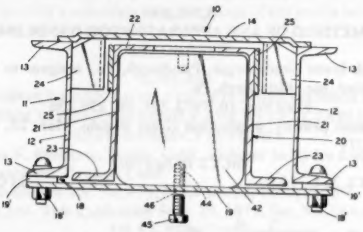
key which extends laterally through the sill and through a pair of aligned openings in the central portion of the yoke of the cushioning device. The key is separate from the coupler pin which connects the yoke to the coupler.

3,791,532
CUSHIONED UNDERFRAME ARRANGEMENT FOR RAILWAY CARS

William H. Peterson, Homewood, Ill., and George L. Rousseau, Munster, Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Oct. 16, 1972, Ser. No. 298,112
Int. Cl. B61g 9/08
U.S. Cl. 213—8 **6 Claims**



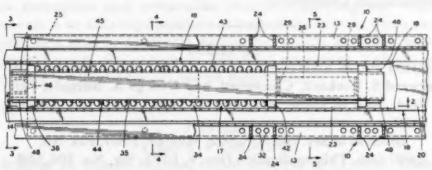


A cushioned underframe of the stationary and sliding sill type includes a cushion pocket within which a hydraulic cushion is supported. The cushion is connected to a carrier plate which provides for installation of the cushion and cover as an integral unit with the cover secured to the stationary sill.

3,791,533
RAILWAY CAR CUSHIONING UNDERFRAME

Robert S. Tamborski, Griffith, Ind., and Joe B. Raidt, Calumet City, Ill., assignors to Pullman Incorporated, Chicago, Ill.

Filed Oct. 16, 1972, Ser. No. 298,113
Int. Cl. B61g 9/08
U.S. Cl. 213—8 **7 Claims**

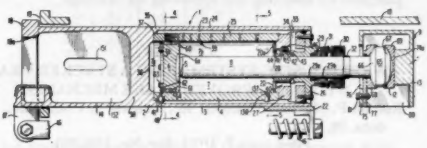


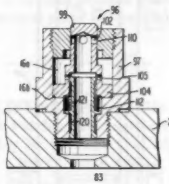
A railway car cushioned underframe includes a stationary and a sliding sill providing a pocket in which a cushioning device is supported. The cushioning device is removable and replaceable with a cover plate connected to the stationary sill. The cushion device includes a cylinder and piston arrangement with a return spring normally urging the device to a neutral position, with the spring and associated elements supported by a tension strap assembly supported within the sliding sill.

3,791,534
VALVE APPARATUS FOR CONTROLLING TRAIN ACTION

Jack G. Stephenson, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation-in-part of Ser. No. 752,649, Aug. 14, 1968, Pat. No. 3,589,528. This application June 25, 1971, Ser. No. 156,853. The portion of the term of this patent subsequent to June 29, 1988, has been disclaimed.
Int. Cl. B61g 9/16
U.S. Cl. 213—43 **6 Claims**





A valve apparatus for controlling "run-in" train action events. The valve is characterized by a valve member which is normally open to provide a low impedance level in an hydraulic cushioning device capable of effectively absorbing buff coupling shock. Fluid reaction surface means associated with the valve member enables the valve member to move to a relatively closed position to provide a high impedance level and thus enable the cushioning device to control "run-in" train action events. A disabling device obviates the function of the reaction surface means, when buff coupling forces act on the cushioning device, so as to cause the valve member to remain open. A biasing means determines the condition of the valve during restoration of the cushioning device from a buff condition.

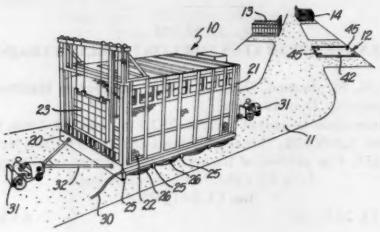
3,791,535
FURNACE MOVING SYSTEM

Terry M. Baker; Robert B. Kieding; Henry W. Huthsing, and Robert E. Burdick, all of Santa Barbara, Calif., assignors to Rolair Systems, Inc., Santa Barbara, Calif.

Filed Jan. 2, 1973, Ser. No. 320,141
Int. Cl. B60v 1/00
U.S. Cl. 214—1 R **3 Claims**

A system for moving 40-ton melting furnaces from the furnace pit to the rebuilding shop and return. A furnace with base and superstructure, with a plurality of air bearings in the base

for moving the furnace on an air film to a pit platform, with a first lifting unit for raising and lowering the platform and furnace, and a second lifting unit for raising the furnace from the platform for inserting and removing air bearings.



3,791,536

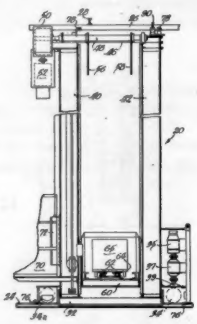
WAREHOUSING SYSTEM USING A STACKER CRANE WITH AN IMPROVED BRAKE MECHANISM

Ronald P. Moeller, Mendota, Ill., assignor to Conco Inc., Mendota, Ill.

Filed June 7, 1971, Ser. No. 150,291

Int. Cl. B65g *1/06*

U.S. Cl. 214—16.4 A **8 Claims**



A self-propelled stacker crane has a tall hoist column captured between a floor mounted horizontal guide rail and a ceiling located horizontal guide tube. A crane carriage is driven along the floor guide rail by a horizontal motor and brake in order to position the crane adjacent horizontally spaced and vertically stacked bins. To eliminate vertical sway and misalignment of the hoist column when the floor driven carriage is braked, a caliper brake mounted at the top of the hoist column is actuated to clamp the ceiling guide tube. The caliper brake is hydraulically actuated under control of a compression spring which is released by deenergization of a solenoid. After a short time delay, the caliper brake may be released by energizing the solenoid in order to correct for any vertical offset in the hoist column.

3,791,537

APPARATUS FOR ORIENTATING AND STACKING CUP-LIKE ARTICLES

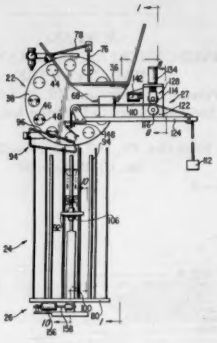
Clayton E. Conklin, 4203 Hookheath, El Paso, Tex.

Filed Oct. 16, 1972, Ser. No. 297,680

Int. Cl. B65g *57/20*

U.S. Cl. 214—6.5 **19 Claims**

Apparatus in which cup-like articles are received within a hopper in random orientation, agitated, and picked up singularly from the hopper by a rotating disc provided with means to orient and transport them to a turntable where they are guided and dropped into vertical stacks in nested relation. An indexing mechanism responsive to the number of articles stacked will cause the turntable to rotate 90° when a predetermined number of articles are present in the stack so that an identical stack of articles can be started.



3,791,538

METHOD OF AND APPARATUS FOR HANDLING FIBERBOARD

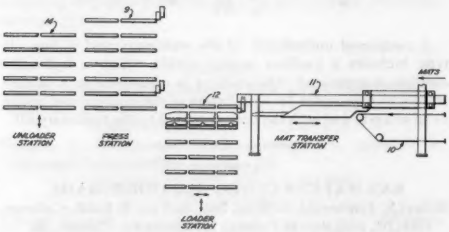
Joseph Irwin Greenberger, Pittsburgh, Pa., assignor to Wean United, Inc., Pittsburgh, Pa.

Filed Feb. 10, 1972, Ser. No. 225,235

Claims priority, application Great Britain, Mar. 23, 1971, 7851/71

Int. Cl. B65g *47/02*

U.S. Cl. 214—16.6 **23 Claims**



The disclosure of the present invention relates to a method of and apparatus for efficiently and rapidly handling mat particles of wood, for example, fir or hemlock particles used to manufacture fiberboards.

3,791,539

HOIST PANS AND HOIST PAN HANDLING APPARATUS

Bernard S. Reckseit, Cincinnati, and George A. Burgess, Fairfield, both of Ohio, assignors to Sweco, Inc,, Los Angeles, Calif.

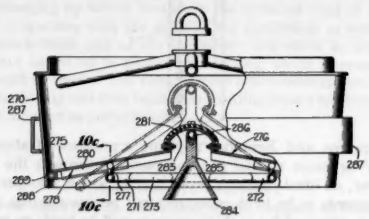
Division of Ser. No. 825,862, May 19, 1969, Pat. No. 3,697,006. This application Dec. 9, 1971, Ser. No. 206,568

Int. Cl. B65g *65/32*

U.S. Cl. 214—17 C **6 Claims**

A material handling system for vibratory finishing or grinding mills into which are placed materials and abrasive media and wherein the materials are operated upon. In a finishing mill the materials are parts which are finished, polished, or deburred, and in a grinding mill the materials usually are chemicals which are reduced in size. The system includes a

vibratory mill into which such materials and media are placed, a vibratory screen separator for separating the materials from media after completion of the operation thereon, a hoist pan for handling the media or material and media, and a jib hoist system for moving and positioning the pan. Media or material and media are loaded into the pan, and same is lowered to the top of the finishing machine causing the load to be evenly dumped into the finishing machine. After the finishing operation, the material may be moved or transported in any suitable manner to any further operation stage, and the media is returned to the hoist pan. A pan driving mechanism is provided for rotating the pan as the media is supplied thereto from the separator or mill such that the pan is evenly loaded. Several bottom-dumping pan configurations are disclosed which provide a relatively even discharge of the media into the mill when the pan engages the mill.



3,791,540

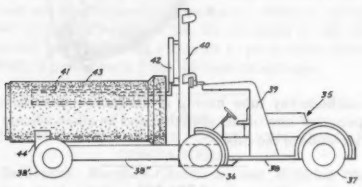
TRANSPORT VEHICLE HAVING LIFT MECHANISM AND ASSOCIATED EXTENDIBLE AND RETRACTABLE MOBILE OBJECT SUPPORT

Thomas K. Breitfuss, Tustin, Calif., assignor to Hydro Conduit Corporation, Orange, Calif.

Division of Ser. No. 875,743, Nov. 12, 1969, Pat. No. 3,682,334. This application Sept. 29, 1971, Ser. No. 184,665

Int. Cl. B60p 1/44

U.S. Cl. 214—75 R **3 Claims**



A wheeled vehicle is disclosed for loading, transporting and unloading heavy objects, including concrete pipe, which has an extendible and retractable mobile object support which travels in an extended position as part of the vehicle when supporting a load and retracts within the vehicle assembly when traveling with the vehicle in unloaded operation. Vehicle assembly is adapted for off and on highway uses.

3,791,541

CARGO PLATFORM

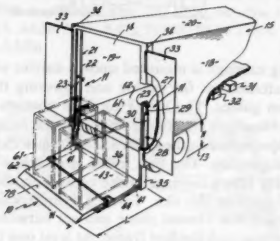
William H. Himes, Dayton, Ohio, assignor to Leyman Manufacturing Corporation, Cincinnati, Ohio

Continuation of Ser. No. 872,108, Oct. 29, 1969, abandoned. This application Feb. 16, 1971, Ser. No. 115,837

Int. Cl. B60p 1/44

U.S. Cl. 214—75 T **4 Claims**

A cargo platform of the type mounted on the rear of trailer trucks that is particularly adapted for use with a combined elevating and storing mechanism for such platforms. The cargo platform includes, in the preferred embodiment, a first section of the platform mounted along the front edge thereof to be combined elevating and storing mechanism by a first pivotal joint, a second section of the cargo platform mounted to the first section adjacent the rear edge of the first section by a second pivotal joint, supports associated with the two sections for holding the sections in platform configuration when desired, locks associated with the two sections for holding the two sections in sandwich configuration when desired, the sections being pivotable between platform configuration and sandwich configuration by means of the second pivotal joint, and at least one wheel fixed to one of the sections adjacent that edge where the sections are pivotally joined, the wheel providing a rolling surface that maintains contact with the ground as the platform, when in sandwich configuration, is lifted at the first pivotal joint from a horizontal attitude whereat it rests on the ground and extends outwardly of the first pivotal joint to a vertical attitude whereat it hangs in the same plane as the vertical plane incorporating the first pivotal joint.



3,791,542

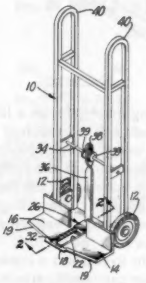
LIFTING APPARATUS

Floyd Mauch, 935 N. Fairfax, Los Angeles, Calif.

Filed May 30, 1972, Ser. No. 257,677

Int. Cl. B62b 1/06

U.S. Cl. 214—370 **3 Claims**



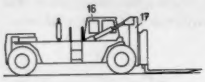
A hand truck having a blade provided with a slot extending toward the leading edge of the blade. A support having a reduced portion slidable in the slot is carried by the blade. The frame of the hand truck carries a pivoted member engageable with the support to slide same toward the leading edge of the blade. In use, the leading edge of the blade is inserted under one side of a load, and the hand truck is then tilted to lift such side of the load. The operator then uses his foot to displace the pivoted member forwardly, thereby sliding the support to a position close to the leading edge of the blade. The operator then lowers the load onto the support, which holds the load while the operator inserts the blade of the hand truck all the way under. The load is then handled in the usual way.

3,791,543

LIFTING CARRIAGE ON A CARRIER

Lahja Arvid Peltonen, Tampere, Finland, assignor to Valmet Oy, Helsinki, Finland

Filed May 24, 1972, Ser. No. 256,593
Int. Cl. B66f 9/14
U.S. Cl. 214—730 3 Claims



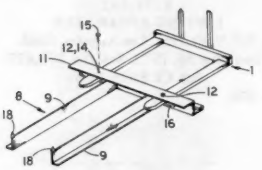
A lifting carriage is mounted upon a carrier which includes a lifting attachment for raising and lowering the lifting carriage upon guides. The lifting carriage consists of a primary lifting carriage to which two frames are attached. Roller tracks are provided between the frames. The frames carry load lifting or gripping means. The first frame is pivotally connected to the primary lifting carriage in the central plane of the carrier by a ball joint or the like. Turning cylinders are located on both sides of this central plane and act between the primary lifting carriage and the first frame. At least one tilting cylinder also acts between the primary lifting carriage and the first frame. Thus the turning and tilting movements of the lifting and gripping means are carried out with reference to the primary lifting carriage.

3,791,544

PULLING ATTACHMENT FOR FORK LIFT TRUCKS

Daniel H. Moses, Fairfield, Ohio, assignor to Champion International Corporation, Hamilton, Ohio

Filed Jan. 27, 1972, Ser. No. 221,219
Int. Cl. B66f 9/12
U.S. Cl. 214—620 5 Claims



A means for handling material with a lift truck is disclosed wherein palletized loads can be reached and positioned for lifting on the forks by use of a probe having a pallet engaging point. The probe is mounted on the forks and extends to a position considerably in advance of the forks where it can engage a remotely located pallet. Once engaged by the probe, the pallet can be moved to a fork engaging position merely by applying a pulling force with the lift fork. The probe is of light weight (in fact too light to support a loaded pallet) construction so that the operator can readily attach and remove it from the fork.

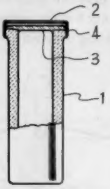
3,791,545

MOISTURE-PROOF SEAL FOR CONTAINERS

Shozo Narusawa; Norit Oshi Iizuka, and Jiro Kawasaki, all of Tokyo, Japan, assignors to Yurin Tokushu Kogyo Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 789,144, Jan. 6, 1969, abandoned. This application Oct. 5, 1971, Ser. No. 186,378
Int. Cl. B65d 23/00, 53/00
U.S. Cl. 215—274 3 Claims

By first applying, either to the entire top peripheral surface of the mouth of a container or to the under-side of its cap member, a packing material having the properties that it will not undergo plastic deformation when subjected to a compression force of the order of 1 kg/cm² but will exhibit plastic flow when subjected to a compression force of about 2 kg/cm² or more and that it exhibits adhesiveness, air-tightness, waterproofness, non-toxicity and resistance to chemicals at normal temperature, and thereafter applying a pressure of about 2 kg/cm² or more to said packing material through the cap member, an ideal moisture-proof sealing which also permits the contents to be held under reduced pressure in the container is obtained for such contents as will be liable to being spoiled upon their exposure to heat and/or moisture.

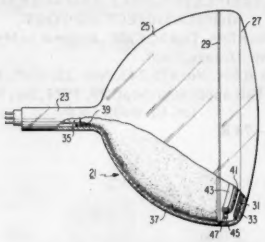


3,791,546

CATHODE-RAY TUBE HAVING CONDUCTIVE INTERNAL COATING COMPRISED OF IRON OXIDE AND GRAPHITE

James John Maley, Lancaster, and Donald Walter Bartch, Columbia, both of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 26, 1971, Ser. No. 202,428
Int. Cl. H05b 33/23; C09c 1/44
U.S. Cl. 220—2.1 A 7 Claims



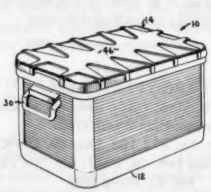
A cathode-ray tube having a conductive internal coating comprised of iron oxide, graphite, and an alkali silicate on the interior walls of the tube.

3,791,547

ICE CHEST CONSTRUCTION

Tony E. Branscum, Winfield, Kans., assignor to Gott Manufacturing Co., Inc., Winfield, Kans.

Filed Feb. 25, 1972, Ser. No. 229,522
Int. Cl. B65d 25/14
U.S. Cl. 220—17 6 Claims



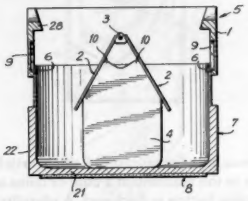
An insulated container has superior insulating qualities and greater strength as a result of a novel lid and receptacle construction. The receptacle is a box-like structure the sidewalls

of which terminate in a curved, generally convex surface. A lid is adapted to be received on the receptacle to close the opening. The lid has an arcuate, generally concave face which is complemental to the surface of the receptacle and provides a substantial area of contact between the lid and receptacle. The area of contact between the lid and receptacle is further increased by a rib which extends around the lid on the inside of the latter and is adapted to engage the receptacle. The aforementioned rib is disposed in parallel relationship to an overhanging lip which comprises the terminal edge of the lid and cooperates with the walls of the receptacle to present a relatively flush side of the container. The rib is so disposed relative to the lip to provide reinforcing which increases the strength of the lip. The construction also minimizes the width of the thin lip and thus facilitates molding from a high-strength material such as polyethylene.

3,791,548
AUTOMATIC ASHTRAY

Ricardo Aguirre Gili, Barcelona, Spain, assignor to Flamagas, S.A., Barcelona, Spain

Filed Mar. 6, 1972, Ser. No. 231,906
Claims priority, application Spain, Mar. 17, 1971, 167060
Int. Cl. A24f *19/00*; **B65d** *7/00, 1/24*
U.S. Cl. 220—20.5 **9 Claims**

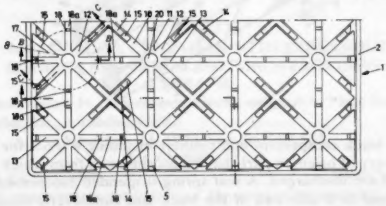


A mechanical ashtray including a refuse receptacle and a lid; when the lid is closed, it supports ashes and when it is open, it permits the ashes to disappear into the receptacle; the lid includes two pivotally supported lid elements which pivot from closed to open position; the ashtray comprises a base receptacle and an upper body interlocked with the base by a notch and pin interconnection; a support element carried by the base receptacle supports the lid elements in the closed position and permits the lid elements to pivot open when the upper body is pulled away from the base receptacle.

3,791,549
TRANSPORTATION CRATE FOR PLASTIC CUPS AND CONTAINERS

Franz Delbrouck, Bergisch-Gladbach, and Wilfried Nickel, Menden, both of Germany, assignors to Freya-Plastic & Franz Delbrousk, Bieberkamp, Germany

Filed July 13, 1971, Ser. No. 163,539
Claims priority, application Germany, July 17, 1970, 2035487
Int. Cl. B65d *1/24, 1/38*
U.S. Cl. 220—21 **8 Claims**

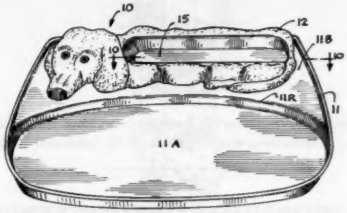


A plastic, stackable transportation crate for carrying plastic cups and containers. The crate has conical side walls and a base formed of intersecting strips. The intersections of the strips support the cups, and at least two of the strips are bent upwardly at an angle parallel to the side walls of the cups carried therein to provide lateral support. Alternate embodiments are considered.

3,791,550
TABLE SERVICE

Alfred D. Duncan, Elmhurst, Ill., assignor to Duncanlite Laboratory, Inc., Villa Park, Ill.

Continuation-in-part of Ser. No. 36,879, May 13, 1970, abandoned. This application Dec. 28, 1970, Ser. No. 101,947
Int. Cl. A63h *7/00*; **A47g** *19/00*; **B65d** *21/02*
U.S. Cl. 220—23.86 **2 Claims**



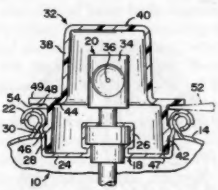
A table service assembly includes a food receptacle and a member presenting an animal caricature coupled thereto. The animal caricature may have a recess in its back for holding a food item; the receptacle may be a tray or a basket, but it may be otherwise.

The caricature is detachably presented by the assembly and may be converted into a wheeled toy.

3,791,551
TAMPER-PROOF CLOSURE FOR SPRAY CANS

John W. Madeira, Akron, Ohio, assignor to Plasti-Kote Company (a div. of Consolidated Foods, Inc.), Medina, Ohio

Continuation of Ser. No. 99,593, Dec. 18, 1970, abandoned. This application Sept. 29, 1972, Ser. No. 292,973
Int. Cl. B65d *41/62*
U.S. Cl. 220—60 **1 Claim**



A tamper-proof closure for enclosing and sealing the valve structure of a spray can. The closure is adapted to be held in position on the can by engagement of an external circumferential snap-in flange of the closure with an annular wall of the can and valve assembly. The closure comprises a tubular skirt section having an external circumferential snap-in flange formed at its lower edge. A valve covering body section is interconnected with the skirt section. A radially extending flange projects from the skirt section. The axial distance between the flange and the lower edge of the skirt section is such that with the closure in place on the can a clearance is defined between the flange and the bead of the can. Such clearance defines a tool access opening or recess. The closure is removed from the spray can as by inserting the end of a tool

in the tool access opening and thereafter lifting a portion of the closure from the can.

3,791,552

HANDLING PERISHABLE PRODUCT

William H. Hayes, Overland, Kans., assignor to Atton Box Board Company, Alton, Ill.

Division of Ser. No. 846,385, July 31, 1969, Pat. No. 3,635,361. This application June 7, 1971, Ser. No. 150,765

Int. Cl. B65d *21/00*

U.S. Cl. 206—501 **2 Claims**

Packaging and handling of perishable products in stacks of articulated disposable containers, in which the disposable containers are intervened and articulated by a rebated ring having a major perimeter and a minor perimeter with an intermediate ledge, and the respective perimeters being proportioned so that the minor perimeter embraces the outside of an articulated container, above, and the major perimeter embraces the outside of another articulated container below, the ring.

3,791,553

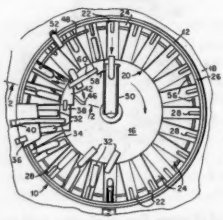
HOPPER-TYPE APPARATUS FOR ORIENTING AND FEEDING TUBULAR CONTAINERS OR LIKE ARTICLES

Samuel S. Aidlin, New York; Stephen H. Aidlin, Valley Stream, and David Rich, Merrick, all of N.Y., assignors to Aidlin Automation, Inc., Brooklyn, N.Y.

Filed Mar. 6, 1972, Ser. No. 232,049

Int. Cl. B65h *9/10*

U.S. Cl. 221—156 **8 Claims**



Hopper-type apparatus for orienting and feeding tubular containers of different lengths and thicknesses in which the containers are picked up from the pile at the bottom of the tilted hopper by a rotating feed ring having radially arranged article receiving pockets. Properly oriented containers are frictionally gripped by a friction bar as they ascend and released at the top of the hopper into an outlet chute. Misoriented containers are held away from the friction bar by pins extending radially into the pockets at their peripheral ends to drop back into the hopper. Properly oriented containers shorter than the pockets are moved into position for gripping by the bar by a jet of compressed fluid as the pockets pass it on their ascent. The raised separations between the pockets forming their side walls are formed with transverse slots opposite a midpoint of the pins, forming an interrupted circle. An arcuate friction bar is adjustably mounted for movement into and out of the slots for gripping containers of different thicknesses.

3,791,554

VENDING MACHINE WITH HANGER CARRIERS

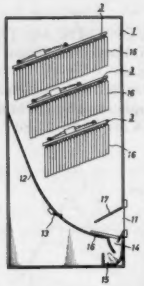
Norimichi Nagatani, and Toyohide Imamura, both of Tokyo, Japan, assignors to Kokusai Keiso Co., Ltd., Tokyo, Japan

Filed Nov. 12, 1971, Ser. No. 198,173

Claims priority, application Japan, Jan. 22, 1971, 46/1609

Int. Cl. G07f *11/16*

U.S. Cl. 221—289 **2 Claims**



A vending machine for releasing a single article at a time by the deposition in the machine of a coin or coins and the operation of a selecting button is disclosed. A plurality of magazines for holding and releasing articles to be delivered are mounted on a slant in the interior of a housing cabinet. The magazines are positioned in a side-by-side, vertically spaced relationship and support rows of hangers carrying articles to be vended. The hangers together with the articles they carry are gravitationally discharged upon the actuation of a hanger releasing means.

3,791,555

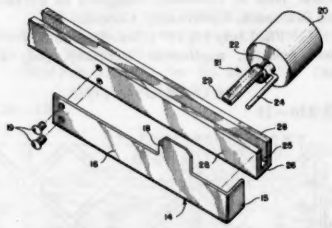
TRACK ESCAPEMENT AND COUNTER

Floyd E. Smith, 5704 Brewster, Erie, Pa.

Filed May 1, 1972, Ser. No. 248,854

Int. Cl. B65g *59/06*

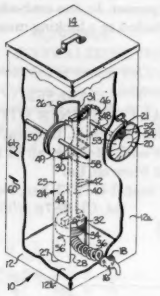
U.S. Cl. 221—298 **9 Claims**



A track escapement and counter including a track for the delivery of oriented parts having an open end from which the parts are discharged. A leaf spring suspended escapement is secured to a side wall of the track and cantileverly secured thereto. An arrest assembly is provided actuated transversely of the track and includes holding and release members. Upon actuating the power source the holding and release members

engage a preselected part having a preselected number ahead of it and continues its motion to engage an actuating pad portion of the cantilever spring thereby moving the escapement which is at the end of the spring to open the end of the track and permit those parts ahead of the part retained by the arrest assembly to drop off the track. Thereafter the arrest assembly is returned to its normal position in timed relation to the prior repositioning of the escapement so that upon each cycle a predetermined number of parts are discharged from the track.

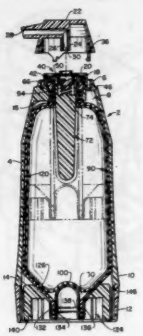
3,791,556
FLUID METERING DEVICE
Norman D. Tarter, 1132 Mt. Kisco Dr., Charlotte, N.C.
Filed Dec. 13, 1971, Ser. No. 207,128
Int. Cl. G01f *11/02*
U.S. Cl. 222—21 **6 Claims**



An apparatus for metering and delivering a pre-selected quantity of a fluid comprising a container for holding a relatively large quantity of the fluid, a vertically extending tube positioned within the container and having an open upper end adapted to lie above the fluid level and an open lower end adapted to lie below the fluid level, and a piston translatably mounted within the tube. The piston has a passageway extending therethrough which is connected via an extensible tube to a delivery spigot attached to the exterior of the container. In use, the piston is initially translated to a position below the open lower end such that the fluid in the container passes into the tube. The piston is then raised to a selected elevation such that the fluid in the tube is retained and lifted causing the excess thereof to spill from the open upper end back into the container. This results in a measured quantity of the fluid carried above the piston, which may then be released through the delivery spigot.

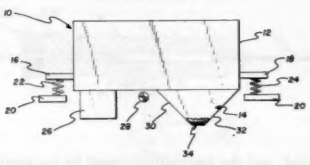
3,791,557
NON-AEROSOL CONTAINER WITH EXPANSIBLE BLADDER AND EXPELLING FORCE PROVIDING SHEATH
Frank Venus, Jr., Watertown, Conn., assignor to Plant Industries, Inc., Anaheim, Calif.
Filed Jan. 13, 1972, Ser. No. 217,553
Int. Cl. B65d *37/00*
U.S. Cl. 222—105 **14 Claims**

A container construction of the expansible member type wherein the substance to be packaged is contained within the expansible member in conjunction with an ensheathing member to provide the expelling force to expel the substance from the expansible member. The container construction is especially useful for the packaging of highly penetrative sub-



stances which heretofore caused permeability problems; and shelf life difficulties; all of which are now overcome.

3,791,558
POWDER DISPENSING APPARATUS HAVING A PREDICTABLE, CONTROLLED FLOW RATE
Jerome M. Katusha, 901 Elmgrove Rd., Rochester, N.Y.
Filed Sept. 7, 1971, Ser. No. 178,096
Int. Cl. B67d *5/64*
U.S. Cl. 222—161 **10 Claims**

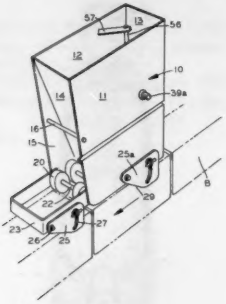


Powder dispensing apparatus including a hopper having at least two sloping side walls which converge to an orificed bottom section. A plurality of loose balls disposed in the hopper are caused to circulate therein by vibrating the apparatus to produce elliptical motion in the hopper, which results in the balls climbing the furthest sloped wall from the center of gravity of the apparatus and then rolling off the far wall onto adjacent walls. From there, the balls fall back through the powder towards the orificed plate and break up any clumped or bridged powder masses. The balls then climb the far wall again and continue to circulate through the powder in the hopper for as long as the elliptical vibratory influence is applied, thereby effecting a predictable, controlled flow rate of powder from the hopper.

3,791,559
HOPPER-TYPE MORTAR SPREADER
Albion G. Foye, 885 E. Dublin-Granville Rd. Apt. E., Columbus, Ohio
Filed Dec. 29, 1972, Ser. No. 319,620
Int. Cl. E04g *21/16*
U.S. Cl. 222—176 **5 Claims**

A mortar spreader which is provided with a hopper for receiving a supply of mortar to be applied to a footer or a course of blocks or the like preparatory to receiving a superimposed course. The hopper is mounted on wheels or rollers, including positively driven ones so it will be propelled along the blocks, is provided with guides for engaging the

lower course to properly guide it therealong, which are retractable when necessary, and is provided with mortar-mixing and positive directing means to feed the mortar towards

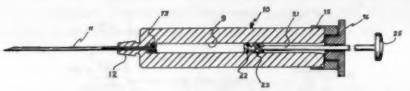


and through two outlets as two longitudinally extending parallel beads or ribbons on the shoulders of the block course or footer.

3,791,560
SEALS (PSC-14)

Rano J. Harris, Sr., Baton Rouge, La., assignor to Precision Sampling Corporation

Division of Ser. No. 762,791, Sept. 26, 1968, Pat. No. 3,577,850. This application Aug. 21, 1970, Ser. No. 66,136
Int. Cl. B67d *5/30*
U.S. Cl. 222—386 **10 Claims**



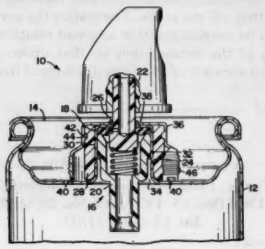
A method, and the apparatus formed by encapsulating and stress forming a thermoplastic material upon a male member, e.g., the needle or plunger of a syringe, or both, to provide a durable and effective leak-proof seal when inserted within enclosing walls defining an opening of restricted diameter. A portion of the said male member is capped with an oversized thermoplastic material, the cap is then reduced in size to correspond to the diameter of the member with which it is to be mated in forming the seal, and then heated up to or just below the softening temperature of the thermoplastic material, generally up to about 425°F., and preferably to about 300°F. The heat stressed member, which is characterized as having very thin layers or films of the stress formed thermoplastic covering the external surface of the member, can then be inserted into snug fit within the mating bore, e.g., the barrel of a syringe, and the tight fit will endure because of the elastic memory of the material by virtue of which it tends to expand to its former size and shape thereby pressing against the enclosing side walls forming the bore.

3,791,561
PRESSURE RELIEF SYSTEM FOR AN AEROSOL DISPENSER

Ronald F. Ewald, Rolling Meadows, Ill., assignor to Seaquist Valve Company, Division of Pittway Corp., Cary, Ill.

Filed July 8, 1971, Ser. No. 160,645
Int. Cl. F16k *17/02*
U.S. Cl. 222—396 **19 Claims**

A pressure relief system for an aerosol dispenser utilizing resilient flexing rings or gaskets arranged in sealing relationship relative to vent ports and/or relief passageways so that, at a predetermined pressure, the force of the propellant and product within the aerosol dispenser acts outwardly against these flexing members to break the seal. Uniquely, the same

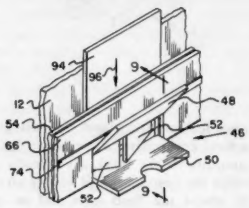


vent ports and/or relief passageways may be used to pressure fill the aerosol dispenser. In one embodiment, a rotatable button overcap is included as a locking means to prevent inadvertent discharge.

3,791,562
BULK MATERIAL CONTAINER WITH POURING SPOUT

Robert A. Bamburg; Farris N. Duncan, both of West Monroe, and Roger M. Floyd, Monroe, all of La., assignors to Olinkraft, Inc., West Monroe, La.

Filed Sept. 14, 1972, Ser. No. 288,899
Int. Cl. B67d *3/00*
U.S. Cl. 222—528 **10 Claims**



An improved bulk material container for use in shipping, storing and dispensing bulk materials from the container. The container may be formed of paperboard and contains a new and novel reclosable pouring spout as well as means for incorporating a slide valve in the pouring spout to control the flow of material through the pouring spout whenever the pouring spout is opened. The pouring spout is formed from a plurality of outer, intermediate and swinging doors with the inner swinging doors serving to keep the outer and intermediate doors in a generally horizontal position to allow the contents of the container to be easily removed. The container also has formed thereon new and novel means for reinforcing the container whenever it is used to handle extremely large weights of bulk materials.

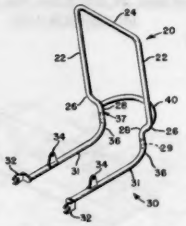
3,791,563
MOTORCYCLE RACK

Terry J. Raat, Seattle, Wash., assignor to White Automotive Corporation

Filed Sept. 15, 1971, Ser. No. 180,556
Int. Cl. B62j *7/04*
U.S. Cl. 224—39 R **6 Claims**

A rack for use upon a motorcycle or other vehicle including a pair of horizontal mounting arms adapted to be secured to the frame of the motorcycle and extend rearwardly of the seat,

and upwardly extending members secured to the arms and supporting a shelf whereby a load may rest upon the shelf and

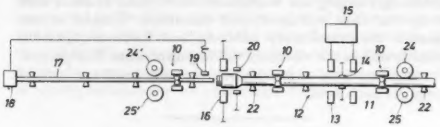


be lashed to the upright members thus providing carrying ability without eliminating the possibility of a second rider.

3,791,564
APPARATUS FOR CENTRALIZING HORIZONTALLY-MOVING PIPE SECTIONS

Gerald H. Hugonin, Cypress, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Aug. 17, 1972, Ser. No. 281,364
Int. Cl. B65g *35/00*
U.S. Cl. 226—19 **12 Claims**



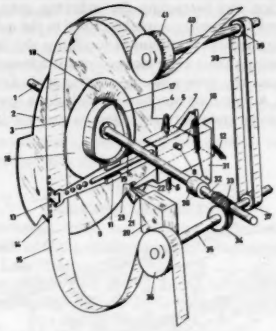
As a preferred embodiment of the present invention disclosed herein for centralizing elongated members, such as joints of oil-field tubing or pipe and the like, being transported by a conveyor along a selected horizontal axis, an opposed pair of intercoupled centralizing rollers are spaced on opposite sides of the axis and cooperatively arranged to normally remain immediately adjacent to the surfaces of a pipe joint being transported by the conveyor. Upon passage of an enlarged portion or bent section of the pipe between the two rollers, control means are provided for selectively separating the rollers in unison as well as imposing selectively-increased opposing forces on the rollers as necessary for retaining the pipe in alignment with the axis.

3,791,565
FILM-TRANSPORTING DEVICE

Jan Hendrik Lucas, Zoetermeer, Netherlands, assignor to Nederlandse Organisatie Voor Toegepast Natuurwetenschappelijk Onderzock Ten Behoeve Van Nijverheid, Handel(En Verkeer), The Hague, Netherlands

Filed Dec. 20, 1972, Ser. No. 316,734
Claims priority, application Netherlands, Dec. 29, 1971, 18032
Int. Cl. G03b *1/22*
U.S. Cl. 226—67 **4 Claims**

The invention relates to a film-transporting device for a film projector equipped with a main shaft that rotates with a constant number of revolutions per second, carries a disc shutter and a cam disc that operates on a pull-down claw for transporting the film that is swivable around two axes, wherein an interlocking mechanism controlled by an electromagnet is mounted that for an adjustable period of time can keep the pull-down claw out of reach of the film, and wherein between

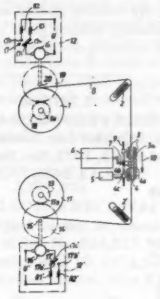


the main shaft and sprockets a single-revolution clutch is mounted controlled by the electromagnet.

3,791,566
INTERMITTENT FOR CINEMATOGRAPHIC APPARATUS

Engelbert Fliesser, Munich, Germany, assignor to Agfa-Gevaert AG, Munich, Germany

Filed Dec. 7, 1971, Ser. No. 205,622
Claims priority, application Germany, Dec. 8, 1970, P 20 60 221.5
Int. Cl. G03b *1/22*
U.S. Cl. 226—68 **5 Claims**



An intermittent for transporting film in motion picture cameras or projectors wherein the movements of the claw of the pull-down into and out of the film plane are effected by an electromagnet and the up and down movements of the claw are effected by the moving coil of an electrical instrument. The supply and takeup reels are rotatable in directions to collect the film by discrete variable-speed d-c motors.

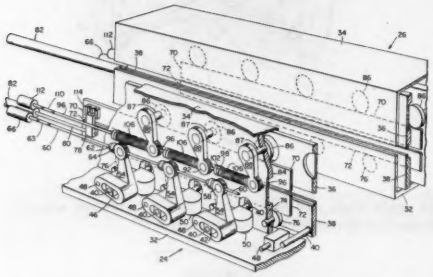
3,791,567
WEB GRIPPING, ADVANCING APPARATUS

Charles M. Schott, Jr., Gloucester, Mass., assignor to Gloucester Engineering Co., Inc., Gloucester, Mass.

Filed Dec. 17, 1971, Ser. No. 209,280
Int. Cl. B65h *17/36*
U.S. Cl. 226—112 **18 Claims**

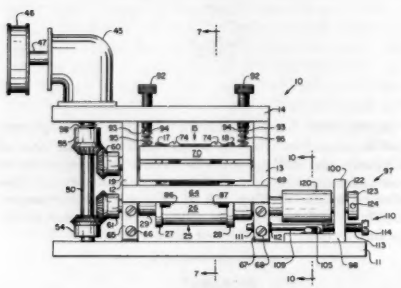
Web gripping, advancing and forming apparatus operable periodically upon successive portions of a continuous web such as heat-softened plastic sheet for forming articles therefrom. The advancing mechanism includes a pair of elon-

gated indexing jaws disposed in an axial direction parallel to the length of the web, arranged together to grip the web over a long extent in the direction of the length of the web, a driver for advancing and retracting the indexing jaws in the axial direction and a clamping assembly, fixed in the axial direction, the clamping assembly mounted to clamp the jaws together while permitting their axial movement for advancing the web, and to release the jaws while permitting their axial retracting movement. A clamping mechanism includes a spaced apart series of pressing members arranged to press a jaw against a



web, the series of pressing members connected to a series of cranks operated in unison by a control rod, preferably with springs either biasing the cranks to gripping position or springs interposed between the control rod and cranks so that the rod acts through springs in urging the jaw to gripping position. Pressing members in the form of rollers permit relative axial movement of jaws, forming a path therefor. The axially moving indexing jaws, of low inertia and lacking self-support against buckling, are slidably guided and supported by axially fixed surfaces including holding jaws. The mechanism extends the length of both warming ovens and forming dies.

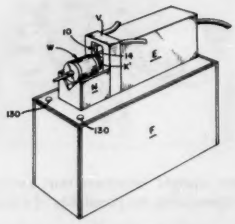
3,791,568
ROLL FEED MECHANISM
Robert Homstead, 5 Quaker Ln., Greenville, R.I.
Filed May 3, 1973, Ser. No. 356,761
Int. Cl. B65h *17/26*
U.S. Cl. 226—140 **4 Claims**



The present disclosure relates to feed mechanisms for stamping presses and similar machines and specifically to an improved roll feed mechanism with a feed stock clamp designed for a fixed feeding increment.

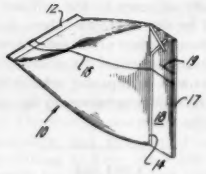
The present invention relates to a novel cam roll mechanism with a feed stock clamp to provide incremental feeding of stock to a punch press or the like.

3,791,569
VIBRATORY WELDING APPARATUS
Bruce L. Mims, Redding, Conn., assignor to Branson Instruments, Incorporated, Stamford, Conn.
Filed Sept. 29, 1972, Ser. No. 293,366
Int. Cl. B23k *1/06*
U.S. Cl. 228—1 **3 Claims**



A vibratory welding apparatus for providing metal to metal welds at a plurality of circumferentially spaced locations of a workpiece, such as a motor armature, comprises a welding apparatus having a tip for engaging the workpiece. A nesting structure for the workpiece includes means for locating the workpiece relative to the tip, means for rotationally indexing in stepped fashion the workpiece on the nesting structure and alternatingly urging the workpiece into forced contact with the tip and then withdrawing it therefrom. Control means sequence the rotationally indexing and force engagement means as well as the vibratory welding apparatus. Energy control means are used to provide substantially equal amounts of energy per each weld.

3,791,570
OPENING MEANS FOR CONTAINERS
Arthur W. Hopkins, Stonebridge Rd., Cornwall, N.Y.
Continuation-in-part of Ser. No. 232,751, March 8, 1972. This application Sept. 15, 1972, Ser. No. 289,615
Int. Cl. B65d *83/00, 17/00*
U.S. Cl. 229—7 R **14 Claims**



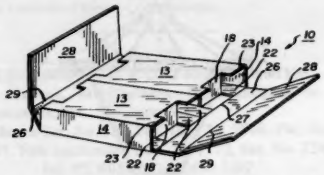
A tetrahedral or similarly shaped container is provided with a pair of tabs at one end. By pulling apart the tabs, an opening is formed at the one end. The end seal at the tab end of the container is shaped and positioned so as to provide for the combination of ease of opening, strong seal which will not distort the configuration of the container. The spout or seal opening region of the seal lies essentially in one longitudinal half of the container, inorder to provide a seal opening structure which utilizes a minimum amount of container material, while providing reasonably large tabs. Preferably, the seal opening is proximate one side of the container, so as to provide a pour spout, particularly in repeated use containers.

3,791,571

CUSHIONED FOLDER

William M. Pilz, III, West Chicago, Ill., assignor to Container Corporation of America, Chicago, Ill.

Filed Sept. 5, 1972, Ser. No. 286,126
Int. Cl. B65d 5/06
U.S. Cl. 229—40 6 Claims



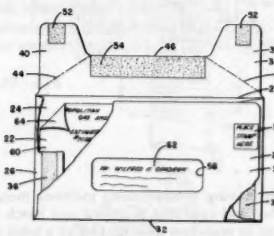
A cushioned folder for a book or similar flat object comprises a rectangular central panel having opposed areas where the board is crushed, with opposed major and minor flaps foldably connected to each other and to opposed margins of the central panel, the minor flaps being folded to position against opposed ends of the article and the major flaps being folded to a position overlying the article. The major flaps are provided with opposed cell forming flaps foldable against other margins of the flat article. Tuck flaps having crushed areas are foldably connected to the cell forming flaps and are folded to position beneath the article in lapping relationship with the crushed areas of the central panel whereby a planar support of the article is provided. A closing flap is foldably connected to the other opposite margins of the central panel and bears against the edges of the major flaps to provide with the cell forming flaps a pair of protective cells. A closure panel is foldably connected to at least one of the closing flaps and is in lapping relationship with the major flaps.

3,791,572

TWO-WAY MAILING ITEM AND CONTINUOUS FORM ASSEMBLY THEREOF

Wilfred H. Gendron, Wilbraham, Mass., assignor to United States Envelope Company, Springfield, Mass.

Filed Mar. 17, 1972, Ser. No. 235,684
Int. Cl. B65d 27/10, 27/04, 27/06
U.S. Cl. 229—69 20 Claims



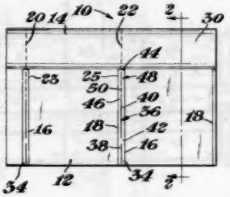
A two-way mailing item comprises a sealed envelope containing a billing statement, order form or other insert. The envelope includes a sealing panel with two end portions used to releasably hold the sealing panel in its closed position during the initial mailing. Upon opening of the sealing panel after the initial mailing, the end portions are removable therefrom by tearing along weakened lines, and the remainder of the sealing panel includes a manually activatable adhesive for use in securing the remainder of the sealing panel in a closed position during the second mailing. One of the removable end portions is located at the upper right-hand corner of the envelope and includes a postage area for the first mailing. Under this end portion, on an underlying panel, is another postage area which is used during the second mailing and which is exposed upon removal of the end portion from the sealing panel. Also, the insert and/or the panels of the envelope produce two different address areas which are alternatively exposed during the initial and return mailings. The envelopes may include a plurality of tabs separable from the body of the envelope for use in securing the mailing items to a carrier sheet to make a continuous form assembly. Spot carbon areas on the carrier sheet or pressure sensitive coatings on the inserts are used to transfer impressions made by typing onto the carrier sheet to the inserts for addressing the mailing items and/or for entering other information onto the inserts.

3,791,573

BAG CONSTRUCTION

Oliver R. Titchenal, Avon, and William A. Armstrong, New London, both of Ohio, assignors to Basic Packaging Systems, Inc., Avon Lake, Ohio

Continuation of Ser. No. 838,992, July 3, 1969, abandoned.
This application Nov. 15, 1971, Ser. No. 199,068
Int. Cl. B65d 27/10
U.S. Cl. 229—69 16 Claims



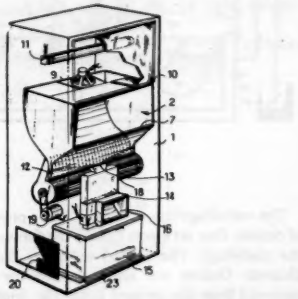
A packaging system using side by side connected tunnel-top bags, or alternately, bags having spreadable flaps at their tops. The closure sealing characteristics of such bags is improved by permitting the bags to be substantially free of each other at their lower regions but securely connected together adjacent upper regions thereof. Upon filling, the free or mid-portion of the bag sides distort inwardly since material is pulled from the sides to "bloom out" the bag. The sides at upper regions, however, being connected as indicated, resist pull or movement inwardly, thereby causing a tautness in the upper parts of the bag material. A substantially wrinkle-free region is thus obtained for a closure seal.

3,791,574

COIN COLLECTOR RECEPTACLE

Jean-Pierre Picquot, 45 Quai Carnot, St. Cloud, France

Continuation-in-part of Ser. No. 824,517, May 14, 1969, abandoned. This application May 10, 1971, Ser. No. 141,948
Claims priority, application France, May 8, 1970, 70.16820; May 14, 1968, 151,777
Int. Cl. B65g 11/16
U.S. Cl. 232—44 1 Claim



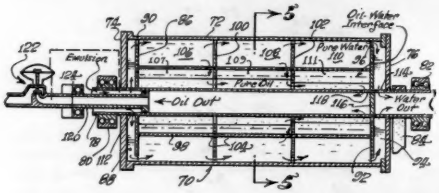
A receptacle for receiving thrown coins or tokens is provided with opposed walls which curve inwardly and

downwardly until they reach a narrow part in which the walls are spaced apart by the thickness of a coin, at which point they become parallel. Inclined guide means at the bottom of the walls directs the coins toward a testing device above a money box. A rod positioned just above the narrow part diverts the coins into a position nearly parallel to the walls as they approach the narrow part.

3,791,575
CENTRIFUGAL SEPARATOR DISCHARGE CONTROL SYSTEM

Ernest D. Kartinen, Long Beach, and Roger W. Lewis, Marina Del Rey, both of Calif., assignors to The Garrett Corporation and The Signal Oil and Gas Company, both of Los Angeles, Calif.

Filed Aug. 30, 1971, Ser. No. 175,886
Int. Cl. B04b *11/02*
U.S. Cl. 233—19 A **34 Claims**

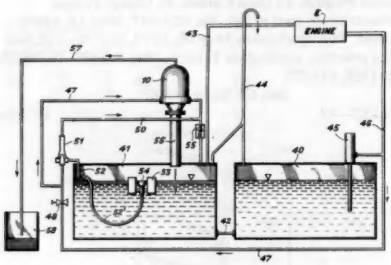


Disclosed is a discharge control system for a centrifugal separator.

3,791,576
CENTRIFUGE

Ludek Bazil, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Jan. 10, 1972, Ser. No. 216,704
Int. Cl. B04b *11/00*
U.S. Cl. 233—19 R **5 Claims**

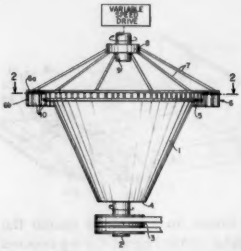


The centrifuge has a two-part rotor provided with two sets of outlets. One set ejects fluid in the form of jets so as to drive the centrifuge. The second set ejects fluid which has been cleaned. Outlets are also provided for the contaminants removed from the cleaned fluid. The liquid flow rate for the drive is high while the flow rate for centrifuging can be low or medium. The liquid flows can be delivered from different sources.

3,791,577
CENTRIFUGE AND ROTATING DISCHARGE MEANS THEREFOR

Jorge Halder Lacher, Apartado 285, Alajuela, Costa Rica

Filed Aug. 8, 1972, Ser. No. 278,722
Int. Cl. B04b *7/04*
U.S. Cl. 233—21 **3 Claims**

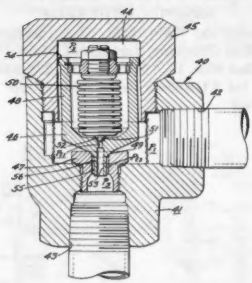


A centrifuge includes a centrifugal drum, a deflector plate for directing the centrifuged material from the drum, and a circumferential baffle plate assembly enveloping the deflector plate. The baffle plate assembly rotates in the same direction as the drum and absorbs the kinetic energy of the centrifugal material in such a way as to minimize damage to the material.

3,791,578
PILOT-OPERATED STEAM TRAPS

Warren H. Brand, Blue Bell, and John Scott, Jr., Huntingdon Valley, both of Pa., assignors to Yarway Corporation, Blue Bell, Pa.

Continuation-in-part of Ser. No. 136,493, April 22, 1971, abandoned. This application Apr. 19, 1972, Ser. No. 245,540
Int. Cl. F16t *1/02*
U.S. Cl. 236—54 **7 Claims**



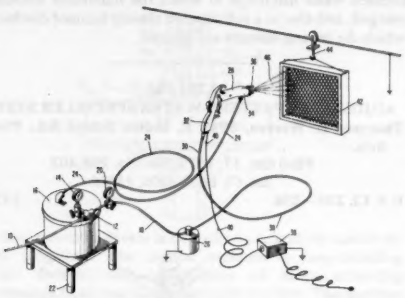
A steam trap having a main valve member mounted in a control chamber and operable to afford and block fluid flow through the trap in response to actuation of a pilot valve by a thermal responsive element mounted on the main valve member is provided with means on the main valve member to channel a quantity of control fluid across the thermal responsive element for improving the response of the steam trap to changes in the temperature of the fluid flowing through the trap. In the illustrated embodiment, a quantity of control fluid is flowed upwardly through a passage around the periphery of the main valve member from the trap inlet and then past the thermal responsive element and through a central passage in the main valve to the trap outlet. Changes in the temperature of the control fluid expands and contracts the thermal responsive element to actuate the pilot valve for applying pressure forces on the main valve to cause the main valve member to engage and disengage its seat. Satisfactory performance of the

trap is insured when the restriction to flow of the central passage in the main valve member is less than the restriction to flow of the peripheral passage of if the capability for mass flow through the central flow passage is greater than the capability for mass flow through the peripheral flow passage, taking into account the pressure differential across each of these flow passages. In another illustrated embodiment the thermal controlled pilot valve controls operation of a second pilot valve which in turn controls operation of the main valve to provide a multi-stage control of flow of condensate.

3,791,579
ELECTROSTATIC PAINT SPRAY SYSTEM

Philip L. Cowan, Morrisplains, N.J., assignor to Electrogasdynamics, Inc., Hanover, N.J.

Division of Ser. No. 788,148, Dec. 31, 1968, Pat. No. 3,645,447. This application Feb. 23, 1972, Ser. No. 228,585
Int. Cl. B05b 5/00; B05c 5/02
U.S. Cl. 239—3 **18 Claims**

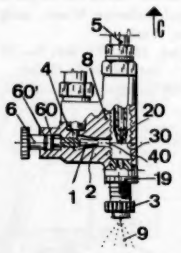


Electrostatic air atomized paint spray system and spray device wherein power of charging air atomized spray droplets and for maintaining electrostatic depositing field is obtained from self-contained electrogasdynamic generator operatively responsive to the flow of seeded atomizing air therethrough.

3,791,580
AIR PRESSURIZED ACTUATED ATOMIZER

Danizzo Taccon, Via G. Di Vittario, 353 20099 Sesto S. Giovanni, Milan, Italy

Continuation of Ser. No. 869,602, Oct. 27, 1969, abandoned. This application Jan. 17, 1972, Ser. No. 218,152
Int. Cl. B05b 7/04
U.S. Cl. 239—414 **8 Claims**

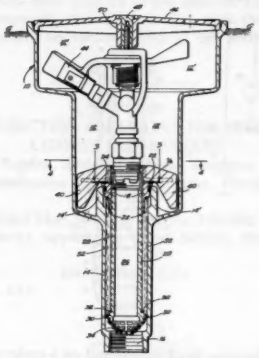


This invention relates to guns or atomizers for spraying moulds with a lubricating liquid composition. There is the necessity of a fine adjustment of the liquid rate even to interception for cleaning the moulds with pressurized air only. A connector is attached to the end of the liquid feeding duct and the end of the pressurized air duct and is formed with a decompression chamber and a passage from the liquid feeding duct to the air pressurized duct is controlled by an adjustment screw up to total interception of the liquid rate. Such a screw may be actuated by the operator from the outside and cooperates with two annular sealing members acting as a brake against uncontrolled rotation of the adjustment screw and therefore of the adjusted rate of the liquid.

3,791,581
POP-UP SPRINKLER

Ho Chow, River Edge, N.J., assignor to Beatrice Foods Co., Chicago, Ill.

Filed Aug. 28, 1972, Ser. No. 284,215
Int. Cl. B05b 3/06, 3/08
U.S. Cl. 239—205 **12 Claims**

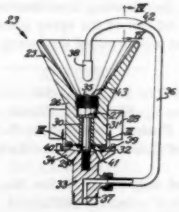


A pop-up sprinkler comprising a housing having an upper relatively wide chamber and a lower guide chamber of reduced diameter. The sprinkler head is mounted on a stem which is in turn mounted in said upper and lower chambers for vertical movement. The stem is provided with stabilizer means vertically slidable with said stem, located in the upper chamber, and shaped to cooperate with walls of that chamber to stabilize the stem, and prevent wobble, significant tilting or lateral movement of the stem, in all vertical positions of the stem.

3,791,582
SPINNER NOZZLE FOR AIR BLAST ORCHARD SPRAYER

Samuel Alfred Mencacci, Antwerp, Belgium, assignor to International Machinery Corporation, S.A., St. Niklaas-Waas, Belgium

Division of Ser. No. 27,017, April 9, 1970, Pat. No. 3,666,177. This application May 13, 1971, Ser. No. 143,177
Claims priority, application Belgium, Feb. 25, 1970, 49936
Int. Cl. B05b 3/04
U.S. Cl. 239—222.17 **4 Claims**



An atomizing nozzle of the type used for discharging liquid agricultural chemicals into the air blast of an orchard sprayer, and including a discharge bell, or spinner cone, having exter-

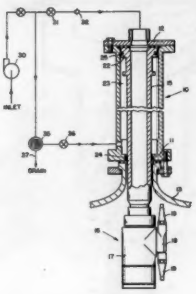
nal air vanes to spin the cone and centrifugally disperse the spray. The spray solution is directed into the cone by a fixed conduit and spray nozzle which are externally located with respect to the cone and its rotary mounting structure in order to eliminate internal flow passages from which the incoming spray solution might escape and cause corrosion or blockage to impair the operation of the nozzle.

3,791,583

SPRAY CLEANING SYSTEM

Erwin J. Nunlist, Penfield, and Howard G. Coleman, Naples, both of N.Y., assignors to Sybron Corporation, Rochester, N.Y.

Filed Mar. 9, 1973, Ser. No. 339,836
Int. Cl. B05b *3/06, 1/28;* **B08b** *3/02*
U.S. Cl. 239—227 **23 Claims**



A spray cleaning head is mounted on a reciprocating cleaning fluid supply tube extending from the open end of a hydraulic cylinder. An annular piston on the tube, the tube itself, and the cylinder define an expansible chamber within the cylinder. A pump supplies cleaning fluid to the closed end of the hydraulic cylinder, whereby the cleaning fluid exerts pressure on the annular piston, and means are provided for supplying fluid to and draining fluid from the expansible chamber. The pressure exerted by the cleaning fluid on the annular piston moves the supply tube and the cleaning head from a retracted to an extended position when fluid is drained from the expansible chamber, and the supply tube and cleaning head are moved back to the retracted position when fluid is supplied to the expansible chamber.

In some embodiments, reciprocating the supply tube moves the cleaning head into and out of an open ended casing attached to the hydraulic cylinder and surrounding the supply tube. A lid closes the end of the casing when the cleaning head is in the casing; and means are provided for filling the casing with fluid when the lid is closed, thereby protecting the cleaning head. Where the cleaning head is of the type having a rotating housing and nozzles rotatably attached to the housing, the lid is preferably attached to the rotating housing, and means are provided for pivoting the lid to close the open end of the casing as the cleaning head moves into the casing and for pivoting the lid out of the spray pattern of the nozzles as the cleaning head moves out of the casing.

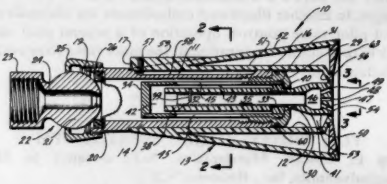
3,791,584

SHOWER HEAD

John H. Drew, Encino, and Robert F. Bentley, North Hollywood, both of Calif., assignors to Rain Jet Corp., Burbank, Calif.

Filed Aug. 25, 1972, Ser. No. 283,717
Int. Cl. B05b *3/02*
U.S. Cl. 239—237 **9 Claims**

A shower head includes a nozzle assembly and an axially movable surrounding adjustment shroud. The nozzle assembly per se is of the rotary stem type and functions to discharge a plurality of separate water streams in a desired rotating pattern. The trajectory of the several streams oscillates within defined limits. Each stream is composed of individual water droplets. The shroud is adjustable axially along the nozzle assembly so that the discharge characteristic of the head is variable, without affecting water flowrate, from a discharge comprised of these several streams to a relatively hard, closely focused water discharge in which the individual streams are merged, and also to a soft aerated closely focused discharge in which the several streams are merged.

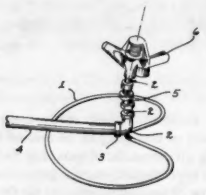


3,791,585

ADJUSTABLE PATTERN WATER SPRINKLER SYSTEM

Thornton L. Warren, 5919 E. Indian School Rd., Phoenix, Ariz.

Filed Oct. 17, 1972, Ser. No. 298,402
Int. Cl. B05b *3/06, 15/04*
U.S. Cl. 239—256 **2 Claims**



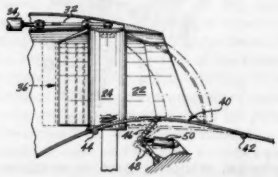
In order to accommodate odd shaped areas to be sprinkled, an impulse sprinkler is supported by apparatus which permits tilting the impulse sprinkler from the vertical in any radial direction. As a result, the sprinkler pattern is altered from a circle (or portion of a circle) to an ellipse-like (or portion thereof) shape.

3,791,586

COMBINATION CLAMSHELL THRUST REVERSER & VARIABLE NOZZLE AREA RAMP

James R. Moorehead, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 26, 1972, Ser. No. 317,908
Int. Cl. B64c *15/04*
U.S. Cl. 239—265.29 **4 Claims**



A failsafe thrust reverser for a jet aircraft engine wherein the reverser unit comprises a pair of clamshell blocker doors

pivotally mounted about vertical axes for rotational actuation. The reverser unit is positioned within a D-shaped or two-dimensional exhaust nozzle duct that has a variable area ramp on its bottom planar surface. The failsafe feature is provided by the variable ramp being positioned within the rotational arc of the clamshell blocker doors such that when the ramp is in its raised or high cruise speed position, the ramp through a blocking action, mechanically jams the blocker doors so that they can not rotate to the reverse thrust position.

3,791,587

FLOW-REDUCING DEVICE PARTICULARLY USEFUL FOR TRICKLE IRRIGATION

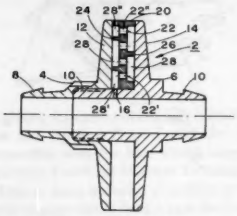
Mordeki Drori, 89 Zahal St., Kiron, Israel

Filed Mar. 15, 1973, Ser. No. 341,713

Claims priority, application Israel, Mar. 17, 1972, 39007; May 23, 1972, 39511

Int. Cl. B05b *1/20*

U.S. Cl. 239—267 **12 Claims**



A flow-reducing device is described particularly useful for trickle irrigation. The device includes a flow-retarding member formed with a plurality of holes extending therethrough from one face to the opposite face. The member is further formed on both faces with a plurality of recesses, each recess bridging a pair of holes. The recesses on one face overlap those on the opposite face, such that the pair of holes bridged by a recess on one face lead to separate recesses on the opposite face. The water is thus caused to flow through the holes and recesses in succession, passing back and forth from one to the other face of the member and finally exiting in a slow trickle.

3,791,588

HEAD SHOWER

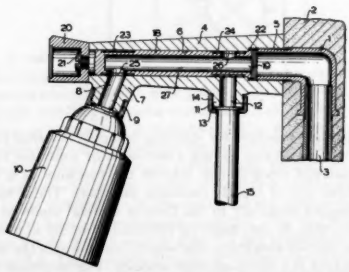
Gunter Buzzi, Schiltach/Black Forest, Germany, assignor to Hans Grohe KG, Schiltach/Black Forest, Germany

Filed Sept. 6, 1972, Ser. No. 286,820

Claims priority, application Germany, Sept. 9, 1971, 2145014

Int. Cl. A62c *31/00*

U.S. Cl. 239—446 **17 Claims**



A head shower includes a shower arm designed as a pipe section for connection of an inlet end thereof to a water supply pipe laid in the wall of a shower enclosure, with the shower arm extending substantially horizontally above head level and having a shower head outlet connection to which there is secured a shower head. An additional outlet connection communicates with the shower arm and is arranged to have a hose shower, for washing the hands and the like, connected thereto. A valve controls flow through the two outlet connections, and a single externally accessible manually operable member cooperates with the valve means to provide for flow of water through only a selected one of the two outlet connections. The valve may be rotatable or axially displaceable in the shower arm, with the manually operable member comprising a handle secured to the free end of the valve. Alternatively, the valve may be rotatable and axially displaceable in the additional outlet connection and extend across the bore of the shower arm. In a further embodiment of the invention, the shower head may be of the shut-off type, and may constitute a manually operable member, with the valve comprising a pressure responsive valve in the additional outlet connection.

3,791,589

FUEL INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINES

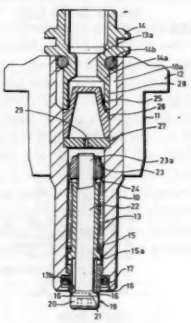
Brian Colin Pagdin, Sutton Coldfield, England, assignor to GKN Transmissions Limited, Erdington, Birmingham, England

Filed Mar. 5, 1973, Ser. No. 338,682

Claims priority, application Great Britain, Mar. 3, 1972, 9942/72

Int. Cl. B05b *1/32*

U.S. Cl. 239—453 **5 Claims**



A fuel injector for use with an internal combustion engine comprising a body through which extends a passageway for fuel, the delivery of which is controlled by a valve member slidably mounted in a tubular guide in the passageway between the closed position to which it is urged by a spring and fully opened position determined by a stop nut on the valve stem, a flow restrictor being provided in the passageway to control maximum delivery rate of fuel when the valve member is fully open.

3,791,590

DRIP INHIBITING GLUE NOZZLE

Julian A. Dieter, Cincinnati, Ohio, assignor to R. A. Jones and Company, Inc., Covington, Ky.

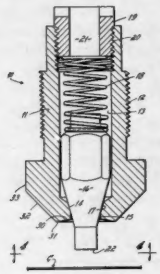
Filed Sept. 27, 1972, Ser. No. 292,771

Int. Cl. B05b *1/32*

U.S. Cl. 239—459 **13 Claims**

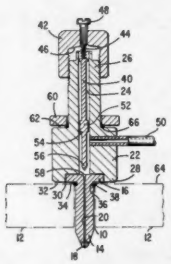
A glue dispensing nozzle has a nozzle face with an orifice and a surface tapering outwardly and downwardly of the orifice to terminate in a flat circular rim. The nozzle has a bore in which resides a spring-loaded plunger having surfaces cooperating with a valve seat in the bore to seal off the flow of

glue to the orifice. An end of the plunger extends through the orifice and forwardly of the rim so as to engage a workpiece and effectively open the nozzle as the nozzle moves further



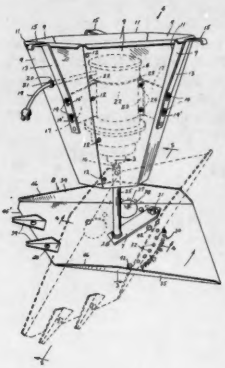
toward the workpiece. When the nozzle is retracted from the workpiece, excess glue on the nozzle face is dispersed over the tapering surface and the flat circular rim to inhibit dripping therefrom.

3,791,591
FUEL INJECTION NOZZLE ASSEMBLY
Harry O. Hedges, P.O. Box 141, Marlton, N.J.
Filed June 8, 1972, Ser. No. 261,092
Int. Cl. B05b *1/30*
U.S. Cl. 239—533 **4 Claims**



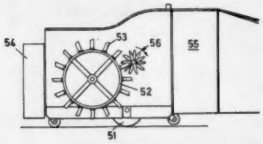
An improved fuel injection nozzle assembly is provided which may be easily removed from an engine block for replacement and maintenance purposes. A valve body may be provided having an axial passageway extending from a first axial end to a second axial end. A pintle may be axially, slideably disposed within the axial passageway and a coil spring may be disposed between a first axial end of the pintle and a fuel pressure adjustment nut, threadedly engaged over a first axial end of the valve body. An adjustment screw may be threadedly disposed axially through the adjustment nut for engagement with the spring, to make fine fuel pressure adjustments. A recess may be formed in a second axial end of the valve body to receive a correspondingly formed head of a spray nozzle and a clamping means may be provided for urging the body and nozzle toward an engine block bore hole. The valve body and nozzle are held in an operational posture solely in response to the action of the clamping member urging the two against the surfaces of the engine block, defining the bore hole.

3,791,592
GRAIN SPREADER
Wayne E. Cobb, 385 Harrison St., Valparaiso, Ind.
Filed Aug. 23, 1972, Ser. No. 283,054
Int. Cl. A01c *17/00*
U.S. Cl. 239—666 **17 Claims**



The invention deals with spreading grain in a bin and comprises a spreader having an impeller which is adjustably secured to a lower offset portion of a driven shaft for directing grain generally radially outwardly for uniform distribution in the bin.

3,791,593
FORM OF TINED SHAFT AND CONSTRUCTIONS OF COMPOSTING MACHINE
Gordon Douglas Griffin, 7 Payne Ave., Devonport, Tasmania, Australia
Filed Aug. 24, 1972, Ser. No. 283,490
Claims priority, application Great Britain, Aug. 24, 1971, 39746/71
Int. Cl. A01c *19/00*
U.S. Cl. 239—667 **14 Claims**



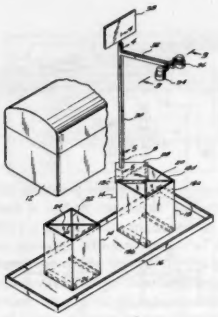
A composting machine for stacking compost material comprising a wheeled frame having a conveyor or roller for feeding the material towards the rear of the machine at a low velocity onto sets of rapidly rotatable members. These members are angled relatively to the central vertical plane of the machine so that, in use, material received from the conveyor or roller is thrown upwardly, rearwardly and towards the sides of the machine at a relatively high velocity. The invention also includes an improved tined shaft having tine members mounted on the shaft with the leading edges of the members tangential to the shaft.

3,791,594

CASKET LIGHTING FIXTURE

Robert H. Relly, 7211 Market Pl., Cincinnati, Ohio

Filed Jan. 24, 1973, Ser. No. 326,247
Int. Cl. F21v *33/00*
U.S. Cl. 240—2 R 7 Claims



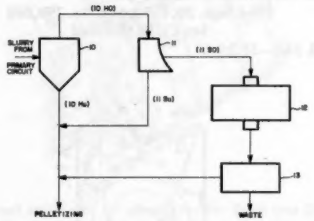
A casket lighting fixture to illuminate a burial casket on display wherein the lighting fixture includes a base support member cooperable with the bier which supports the casket. The bier is provided with an internal X-frame for rigidity and the lighting fixture base includes provision to fit over the top of the bier and engage the X-frame and the bier and is held in firm supporting relationship on the bier by the weight of the casket itself.

3,791,595

METHOD FOR PROCESSING IRON ORE CONCENTRATES

William M. Aubrey, Jr., Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Dec. 20, 1972, Ser. No. 316,963
Int. Cl. B02c *25/00*
U.S. Cl. 241—20 5 Claims



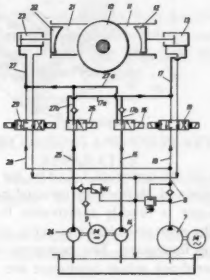
A water slurry of an iron ore concentrate from concentration equipment, for example, magnetic separators in a primary circuit containing fine high grade mineral particles, coarse low grade middling particles and coarse high grade mineral particles, is pumped to a hydrocyclone in a regrind circuit. The water slurry is separated in the hydrocyclone into (1) an overflow fraction containing substantially all the fine high grade mineral particles and coarse low grade middling particles, and (2) an underflow fraction containing substantially all the coarse high grade mineral particles. The underflow fraction has a pulp density greater than 2.7 and preferably between 3.0 and 3.6. The overflow fraction is further classified into an undersize fraction containing substantially all the fine high grade mineral particles and an oversize fraction containing substantially all the coarse low grade middling particles. The oversize fraction is reground and reconcentrated prior to sending to subsequent treatment, such as pelletizing. The hydrocyclone underflow and the fine high grade mineral particles are sent to subsequent treatment, such as pelletizing, without regrinding.

3,791,596

CONTROL ARRANGEMENT FOR PRESS GRINDER

Helmut Thumm, Robert-Koch-Strasse 64; Gerd Ruessmann, Steinstrasse 4, both of 7920 Heidenheim/Brenz, and Josef Kotitschke, Kappelstrasse 33, 7924 Steinheim, all of Germany

Filed May 26, 1071, Ser. No. 147,061
Claims priority, application Germany, June 10, 1970, 7021704
Int. Cl. B02c *23/02*
U.S. Cl. 241—34 15 Claims



The specification discloses a press grinder for mechanically reducing wood to wood pulp in which two or more press boxes are arranged about the grinding wheel and have pressure members for pressing wood work members against the wheel. Each pressure member has a double acting fluid motor, and a separate high pressure pump is provided for supplying each fluid motor in the advancing direction. A low pressure fluid system is provided for actuating the fluid motors during change over when a new work member is inserted in a press box. When advance movement of a pressure movement is interrupted the discharge from the high pressure pump therefor is diverted to another fluid motor to increase the advancing speed thereof, whereby the load of the grinding wheel remains substantially constant at all times.

3,791,597

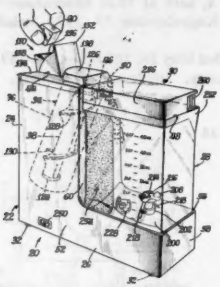
COMBINATION ICE CRUSHER AND DRINK MIXER

John Walter, Evergreen Park; Worthy L. Chambers, Lombard, and John M. Stipanuk, Elmhurst, all of Ill., assignors to Sunbeam Corporation, Chicago, Ill.

Filed Feb. 14, 1972, Ser. No. 226,157
Int. Cl. B02c *19/00*
U.S. Cl. 241—100 43 Claims

A combination ice crusher-drink mixer appliance which serves either as an ice crusher or as a drink mixer or as a combination of the two whereby to provide crushed ice to a drink as it is being mixed. An electric motor is operably connected to an upwardly inclined ice-crushing auger which is rotatable in an ice-crushing barrel whereby ice cubes introduced to the lower end of the auger-barrel combination through a vertically disposed ice chute are simultaneously crushed, sized, and transported upwardly to a crushed ice discharge port at the upper end of the barrel. A crushed-ice-receiving and drink-mixing container has an agitator mounted off center in the bottom thereof with the container being selectively positionable adjacent the crushed ice discharge port in either of two positions. In one of these positions only, the agitator is automatically coupled to the electric motor. The path of ice movement through the appliance from the entrance to the ice chute

to the bottom of the container is in the form of an inverted N and the ice crushing auger and barrel are formed of high strength plastic. The drive connection between the electric motor, which has a built-in impact clutch, and the auger includes a gear reduction mechanism and a modified universal-joint with the drive ratio therebetween being in the order of 100:1, the drive ratio between the electric motor and the



agitator being in the order of 1:1. The ice chute has a cover which, when opened, defines an upward extension of the ice chute. The auger is readily removable from the barrel for cleaning and the container has a pouring spout with a strainer and a hand-grip formation. The components of the combination ice crusher-drink mixer appliance are nested together to provide a compact multi-purpose appliance which occupies a minimum amount of countertop space.

3,791,598

THREAD DELIVERY DEVICE

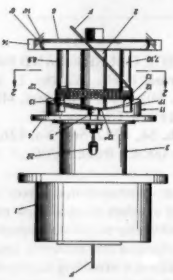
Giuseppe Vischiani, and Alberto Gustavo Sarfati, both of Como, Italy, assignors to Sobrevin Societe de Brevets Industriels-Etablissement, Vaduz, Liechtenstein

Filed July 19, 1971, Ser. No. 163,959

Claims priority, application Germany, July 19, 1970, 2035754; July 25, 1970, 2037031; Apr. 21, 1971, 2119356

Int. Cl. B65h *51/20*

U.S. Cl. 242—47.12 **18 Claims**



A delivery device for running threads with a winding body, to which the thread for forming a winding storage runs tangentially in the rearward range and from which the thread is pulled in axial direction over head, which comprises a winding body including a polygon of a plurality of individual rods. An abutment face is controlled trailingly to a thread feeding station and projects beyond a feeding plane, in order to advance the winding storage towards the head end of the winding body.

3,791,599

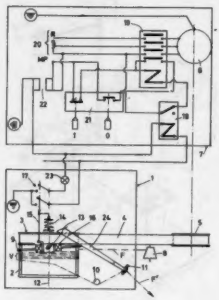
THREAD SUPPLY DEVICE FOR TEXTILE MACHINES

Kurt Arne Gunnar Jacobsson, Ulricehamm, Sweden, assignor to Aktiebolaget Iro, Ulricehamm, Sweden

Filed Nov. 24, 1972, Ser. No. 309,288

Int. Cl. B65h *51/20*

U.S. Cl. 242—47.12 **7 Claims**



A device for monitoring the thread supply available in the thread supply means for textile machines. In a thread supply device for a textile machine it is known to provide a transport device movable axially of the thread storage drum for effecting axial movement of said thread along said drum. Means, which in the illustrated embodiment are mechanical means, are provided in connection with said transport device which means, when said transport device in acting on said thread reaches a predetermined axial position, in turn operate to initiate a switching sequence for stopping the textile machine.

3,791,600

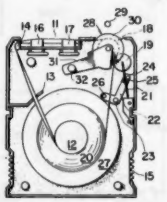
COMBINATION PINCH ROLLER DEPRESSER AND TURNTABLE BRAKE MECHANISM FOR ENDLESS TAPE CARTRIDGE

Tsunehiro Tsukagoshi, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sept. 20, 1972, Ser. No. 290,600

Int. Cl. B65h *17/48*

U.S. Cl. 242—55.19 A **2 Claims**



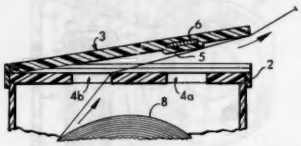
An endless tape cartridge includes a two-step pinch roller, the larger diameter portion of which is engageable with a capstan when inserted in a player to rotate the pinch roller. The tape is fed from and back to a turntable between the smaller diameter pinch roller portion and a pressing roller carried by a leaf spring. A pivoted, L-shaped brake lever has a brake member on one end adjacent to the truntable and is coupled to the leaf spring at its opposite end. When the cartridge is removed from play position on the player, the leaf spring applies the brake member against the turntable and restrains the pressing roller from forceful contact with the pinch roller.

3,791,601

TISSUE ROLL DISPENSER

Kenneth John Broden, 15 Barberry Dr., Rumford, R.I.

Filed June 12, 1972, Ser. No. 261,662
Int. Cl. B65h *19/00*
U.S. Cl. 242—55.53 4 Claims



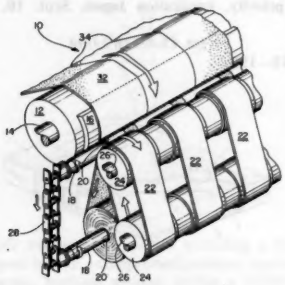
A portable, free-standing tissue paper dispenser including a container in which a roll of the tissue paper is received, the container including a guide plate mounted on the top thereof and having a slot through which a length of the tissue paper extends, a lid being pivotally joined to the guide plate and being movable upwardly relative thereto in response to an outward force exerted on the tissue paper and permitting a selected length of tissue paper to be extracted from the container, the lid being movable into engagement with the guide plate in a closed position for immobilizing the tissue paper so that the selected length thereof may be extracted from the container.

3,791,602

ROLL REWINDER TRANSFER APPARATUS AND METHOD

Eric N. Isakson, Menasha, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Mar. 13, 1972, Ser. No. 234,140
Int. Cl. B65h *19/20, 75/28*
U.S. Cl. 242—56 A 9 Claims



Method and apparatus for sheet transfer from one finished rewound roll of multi-ply sanitary tissue, paper towelling or the like to the core of another roll to be wound without interruption of the web unwinding process. By timing the transfer such that the sheet is broken at a tangent point on the finished roll, problems relating to ply separation are avoided. Also included are improved means for obtaining tail tacking.

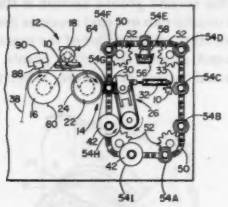
3,791,603

METHOD AND APPARATUS FOR IMPROVED WEB TRANSFER

Gary L. Lenius, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Sept. 18, 1972, Ser. No. 290,268
Int. Cl. B65h *19/20, 75/34*
U.S. Cl. 242—56 R 10 Claims

Improved method and apparatus for obtaining transfer of a web from a parent roll to sequentially supplied cores for rewinding. A transfer roll having a deformable surface is utilized in combination with a piston or the like for urging the individual cores against the web and the transfer roll surface. The deformable surface provides increased wrap of the web around the core and insures smooth web transfer without excessive wrinkling. In a preferred embodiment a phase shift differential arrangement is included to adjust the location of sheet or web separation upon breaking.

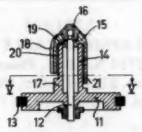


3,791,604

MAGNETIC RECORDING AND/OR PLAYING BACK APPARATUS

Matheus Johannes Marie Meermans, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 10, 1972, Ser. No. 233,661
Claims priority, application Netherlands, Mar. 25, 1971, 7104001
Int. Cl. B65h *17/02*
U.S. Cl. 242—68.3 3 Claims



In an apparatus for recording and/or playing back magnetic recordings on and/or from a magnetic tape accommodated in a cassette, having at least one winding spindle adapted to be received in a flangeless winding core provided in the cassette, the winding spindle comprising a turntable which is mounted for rotation and has a sheath-like hub. A carrier element is mounted on this hub and has the shape of an ogival hat with radially projecting ogival carrier ribs. The turntable and the carrier element have abutment means which limit the relative rotation of the carrier element with respect to the turntable and by which the rotation of the turntable is imparted to the carrier element.

3,791,605

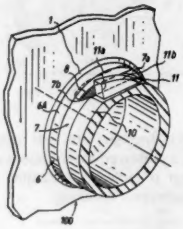
ROTARY SPOOL FOR STORAGE OF CONVOLUTED PHOTOGRAPHIC FILM OR THE LIKE

Rudolf Blank, Cologne, and Achim Kluczynski, Porz-Eil, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed July 31, 1972, Ser. No. 276,535
Claims priority, application Germany, July 31, 1971, 2138429
Int. Cl. B65h *75/28*
U.S. Cl. 242—74 10 Claims

A rotary spool for storage of convoluted elongated flexible strips (such as photographic film or magnetic tape) of the type having a relatively wide end portion followed by a relatively narrow neck portion has a substantially cylindrical core pro-

vided in its external surface with a circumferentially extending groove having a main section whose width slightly exceeds the width of a neck portion and a second section whose width slightly exceeds the width of an end portion. That part of the main section which is immediately adjacent to and communicates with the second groove section is flanked by a pair of ledges which overlie two internal recesses provided in the core and communicating with the part of the main section as well as with the second groove section at points located inwardly from the external surface of the core. When the end portion of



a strip is inserted into the second groove section and is moved in a direction to enter the recesses of the core, the ledges hold the thus inserted end portion against separation from the spool. A projection in the part of the main groove section has a stop face which prevents the movement of end portion from the recesses back into the second groove section. The projection has a sloping surface located inwardly of the ledges and serving to guide the end portion from the second groove section into those ends of the recesses which are remote from the second groove section.

3,791,606
COLLAPSIBLE CABLE SPOOL

Wallace N. Brown, 2714 N. 21 St., Phoenix, Ariz.

Filed Dec. 27, 1971, Ser. No. 211,975
Int. Cl. B65h *75/22, 75/14*
U.S. Cl. 242—115 **6 Claims**

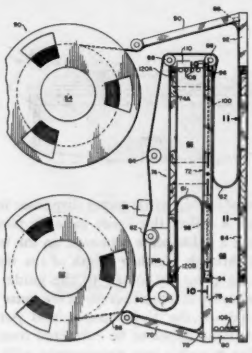
A collapsible cable spool having radially fluted flanges and a plurality of foldable drum or core sectors pivotally carried in the flutes to permit the spool to be collapsed for storage and shipment.

3,791,607
LIGHT COLLECTING AND TRANSMITTING APPARATUS

Daniel M. Klang, Huntington Station, and Roger Mosciatti, Coram, both of N.Y., assignors to Bucode, Inc., Hauppauge, N.Y.

Continuation-in-part of Ser. No. 198,588, Nov. 15, 1971. This application June 28, 1972, Ser. No. 267,155
Int. Cl. G11b *15/06, 15/58, 23/12*
U.S. Cl. 242—184 **7 Claims**

An optical device for collecting and transmitting light is described. It consists of a longitudinal bar which is composed of transparent material and which has a plurality of totally reflecting prisms arranged in step-like fashion along an inclined surface of the bar. Light incident on one side of the

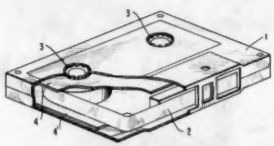


bar is reflected within the bar toward the base of the bar and light incident on the base of the bar is reflected out one side of the bar.

3,791,608
FRICTION SHEET FOR A MAGNETIC TAPE RECORDING CASSETTE

Goro Akashi, and Takashi Hirakawa, both of Kanagawa, Japan

Filed Sept. 10, 1970, Ser. No. 71,127
Claims priority, application Japan, Sept. 10, 1969, 44-71885
Int. Cl. G11b *23/04*
U.S. Cl. 242—199 **13 Claims**



A tape guide sheet for a magnetic tape recording cassette, said sheet comprising a support sheet of a plastic material or paper, one surface of said sheet having a layer containing a powder or graphite, molybdenum bisulphide or tungsten bisulphide, the opposite surface of said sheet having a layer of aluminum.

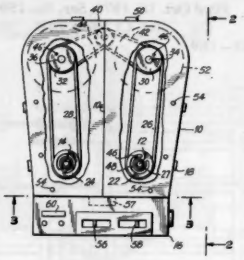
3,791,609
ADAPTER FOR INCREASING THE CAPACITY OF TAPE RECORDERS

Peter Roma, New York, N.Y., assignor to Video Circuits, Inc., Elmsford, N.Y.

Filed Aug. 16, 1971, Ser. No. 171,853
Int. Cl. G11b *15/32*
U.S. Cl. 242—201 **10 Claims**

An adapter is secured to the case of a tape recorder, its drive being coupled coaxially to the tape-reel drive means of

the tape recorder. Separate drive shafts projecting from a plate of the adapter carry larger capacity reels than the tape recorder is designed for, increasing the capacity of the tape recorder.



3,791,610

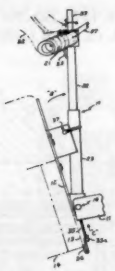
AIRCRAFT EJECTION SEAT ACTUATION SYSTEM

John W. Garrett, Bellbrook; Milton Alexander, Fairborn, and Ralph R. Riepenhoff, Dayton, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 19, 1972, Ser. No. 298,976

Int. Cl. B63d *25/08*

U.S. Cl. 244—122 A **10 Claims**



An aircraft seat ejection device including a handle and upright support held in a compressed position, against the urging of separate, built-up springs, within a cover manually operable by the pilot to an open position to free and allow the springs to extend both handle and support into a pop-up position, and open the handle into a hand-gripping position between the legs of the pilot. An actuator-rod, mounted in compressed and telescopic relation within the upright support, and interconnected to a cable attached to the seat ejection-firing mechanism is manually releasable, by the operation of a trigger mounted on the handle, to thereby operate the cable and initiate actuation of the firing mechanism.

3,791,611

CAPTIVE INFLATED LIGHTER-THAN-AIR STRUCTURES

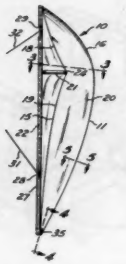
Lewis E. Babbidge, 1743 Holyoke Ave., East Cleveland, Ohio

Filed Sept. 11, 1972, Ser. No. 287,819

Int. Cl. B64c *31/06*

U.S. Cl. 244—153 R **9 Claims**

Captive inflatable lighter-than-air structures comprised of heat-retaining metallized film envelopes for the inflating gas. Internal and/or external stays, suitably guyed if desired, may be used to maintain shape and configuration of envelopes against distortion by internal gas pressure. Structures may be used as kites, mobile sculptures, and/or displays. In kites the metallized film functions as a radar reflector.



3,791,612

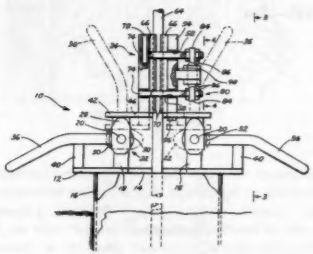
DEVICE FOR GRIPPING AND IMPARTING SLACK IN A CABLE

Carl A. Gustavson, Verona; Emmett B. Shutes, Turtle Creek, and Paul C. Wuenschel, Glenshaw, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed May 25, 1972, Ser. No. 256,780

Int. Cl. G01v *1/24*

U.S. Cl. 248—49 **7 Claims**



A device for clamping and supporting a cable, usually vertically, and imparting a predetermined amount of slack into the cable, comprising clamping means and means to lower the entire clamping means a predetermined amount corresponding to said predetermined amount of slack.

3,791,613

CABLE CHANNEL

Johann Theodor Nollen, Nieuwerkerk a/d Ijssel, Netherlands, assignor to Verlichtings-en-Metaalwaren Industrie "Gouda-Holland" N.V., Industrieterrein, Haastrecht, Netherlands

Filed Feb. 16, 1973, Ser. No. 333,419

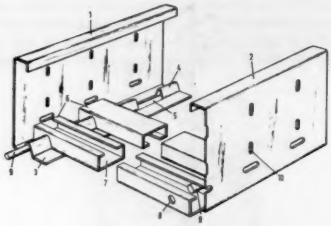
Claims priority, application Netherlands, Feb. 22, 1972, 7202315

Int. Cl. H02g *3/04*

U.S. Cl. 248—49 **1 Claim**

A trough-shaped body for channelling electric cables, which body is composed of substantially parallel side walls and sub-

stantially parallel bottom members extending between the side walls. The bottom members are secured to the side walls by



means of a pin inserted through holes in the bottom members under the apexes of V-shaped depressions in the side walls.

3,791,614

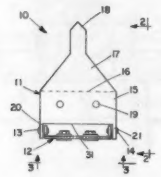
PIVOTABLE WALL MOUNTING BRACKET

Donald M. Scheer, 4407 Central Ave., Indianapolis, Ind.

Filed July 12, 1972, Ser. No. 270,942

Int. Cl. E05d *17/00*

U.S. Cl. 248—216 **3 Claims**



A first and second element are pivotally hinged together. The first element is separated into a first and second portion by an indented line extending laterally across the first element. The first portion has a tapered configuration for driving the first element into a wall and an alternate embodiment has an end positioned at a right angle to hook over a brick when the bracket is mounted to a brick wall. The first element includes a pair of ears upon which the second element is mounted. The ears form stop surfaces for limiting the inward travel of the first element into the wall. The second element has a plurality of slidably mounted fastening nuts which are positioned between the second element and the wall. The bottom end of the second element extends inwardly towards the wall and cooperatively with the stop surfaces spaces the second element from the wall preventing the fastening nuts from contacting the wall.

3,791,615

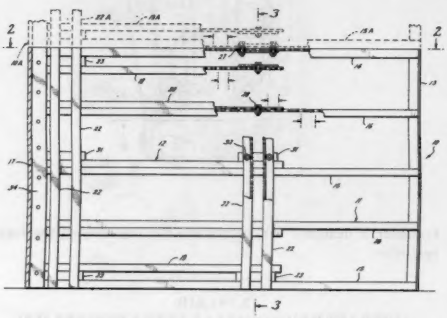
PANEL FOR USE IN A MODULAR CONCRETE FORM

Josh F. Ewing, Converse, Tex., assignor to Ewing-Records & Associates Inc., Converse, Tex.

Filed Oct. 14, 1971, Ser. No. 189,457

Int. Cl. E04g *9/00*

U.S. Cl. 249—189 **7 Claims**



A modular concrete form panel made up of laterally adjustable and interfitting sections.

3,791,616

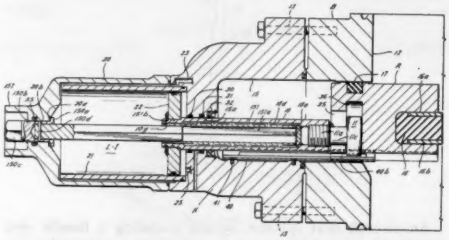
NON-ROTATING RAM ROD LOCKING ASSEMBLY FOR BLOWOUT PREVENTER

Robert K. Le Rouax, Houston, Tex., assignor to Hydril Company, Houston, Tex.

Filed Sept. 8, 1971, Ser. No. 178,713

Int. Cl. E21b *33/06*

U.S. Cl. 251—1 **6 Claims**



A non-rotating ram rod locking assembly for a blowout preventer having a new and improved means for locking the ram in its sealing position, and means for preventing rotation of the ram rod itself during actuation of the locking assembly.

3,791,617

POSITIVE OPENING AND CLOSING CONSTRICTABLE TUBE VALVE WITH MEANS FOR PROLONGING TUBE LIFE

Irving D. Press, West Orange, N.J., assignor to Resistoflex Corporation, Roseland, N.J.

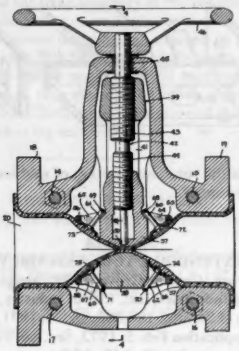
Filed July 14, 1971, Ser. No. 162,407

Int. Cl. F16k *7/06*

U.S. Cl. 251—8 **20 Claims**

Notched edge clamps cooperate with lateral extensions on the compressor members for ensuring sealing while the clamps have smoothly rounded diverging mouths for preventing crack inducing flexure of the tube in a constrictable tube valve. A limber wishbone shaped yoke maintains sealing pressure. Wings on the compressor members with transition curves

guide the tube during flexure. Connections with lost motion between bosses on the tube and respective wings provide positive opening. Resilient extensions are provided on a modification of the compressor members. The tube and bosses are formed by extruding a tube with longitudinal ribs and then machining away the undesired sections of the ribs.



3,791,618

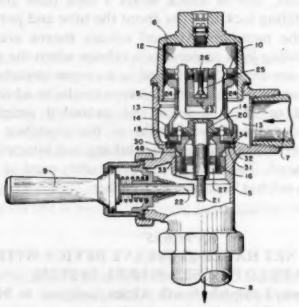
QUIET FLOW DEVICE FOR FLUSH VALVES

Axel B. Nelson, Mount Prospect, and Roman F. Spacko, Darien, both of Ill., assignors to Sloan Valve Company, Franklin Park, Ill.

Filed May 1, 1972, Ser. No. 248,930

Int. Cl. F16k *47/02, 31/383*

U.S. Cl. 251—37 **6 Claims**



A piston type flush valve having a main valve seat in the body is provided with a ring-shaped quieting device adjacent the main valve seat to quiet the water flow during the closing off action of the valve.

3,791,619

VALVE CONSTRUCTION

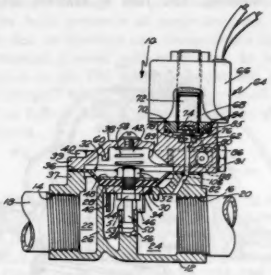
Alfred W. Pett, Warwick, R.I., assignor to New England Union Co., West Warwick, R.I.

Filed Jan. 31, 1972, Ser. No. 222,101

Int. Cl. F16k *31/385, 31/40*

U.S. Cl. 251—45 **7 Claims**

A solenoid operated valve construction for controlling flow of a fluid therethrough and including a diaphragm assembly, the movement of which is responsive to a pressure differential thereacross, means being associated with the diaphragm assembly for producing a change in the differential pressure thereacross at a controlled rate, wherein the kinetic energy of the fluid in the pipes interconnected to the valve construction is effectively absorbed, thereby preventing damage to the system and at least preventing the occurrence of waterhammer on the system.



3,791,620

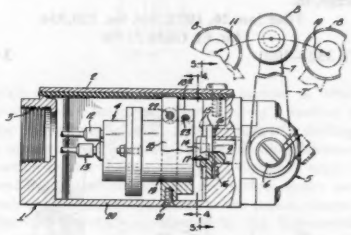
CAM-ACTUATED MAGNETIC VALVE

William M. Scott, c/o Sun Oil Company, Bishop Hollow Rd., Newtown Square, Pa.

Filed May 2, 1972, Ser. No. 249,586

Int. Cl. F16k *31/08, 31/52*

U.S. Cl. 251—65 **7 Claims**



A mechanical arrangement is provided for mounting a magnetically-operated valve (which is adapted to control a fluid) in a housing having cam-actuating means associated therewith, so that the valve can be operated by the cam-actuating means, in the same fashion as a cam-actuated electrical limit switch.

3,791,621

FLUID CONTROL APPARATUS

Asadollah Hayatdavoudi, Madison, Wis., assignor to Petroleum Associates of Lafayette, Inc., Lafayette, La.

Filed Mar. 12, 1973, Ser. No. 340,577

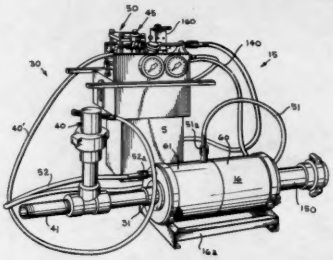
Int. Cl. F16k *47/00*

U.S. Cl. 251—122 **3 Claims**

A method and apparatus for controlling fluid flow from a variable pressure source by a housing which is provided with an inlet for receiving flow from a variable pressure source and an outlet for discharging flow from the housing. Flow constrictor means are mounted within the housing in the form of spaced orifice plates defining flow chambers therebetween. A double acting ram is provided with a conical member mounted thereon with its apex pointed upstream to position the conical member within the orifice plates and chambers defined therebetween to stepwise reduce the pressure and velocity of the variable pressure source.

Means measure the pressure of the variable pressure source at the housing inlet and operate valve means and motor means

so that the ram with the conical member thereon may be positioned longitudinally relative to the orifice plates and chambers in response to the pressure of the source measured at the housing inlet to thereby restrict flow from the variable source through the housing. The ram is sealably and movably



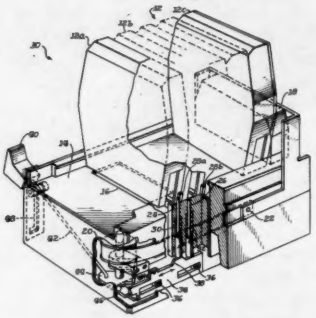
mounted within the housing so that the fluid medium which controls its position, while acting in response to the variable pressure from the source at the housing inlet does not comingle with the fluid pressure from the source during its passage from the inlet to the discharge end of the housing.

3,791,622

INDEXING MECHANISM

Arthur E. Nupnau, Chicago, Ill., assignor to Bell & Howell, Chicago, Ill.

Filed Jan. 26, 1972, Ser. No. 220,954
Int. Cl. G03b *21/04*
U.S. Cl. 352—123 **3 Claims**



An indexing mechanism for sequentially presenting each of a plurality of cassettes containing photographic film to a projection station in a film projector. The indexing mechanism includes a pair of stop members that are alternately placed in and out of engagement with an abutment on the cassette.

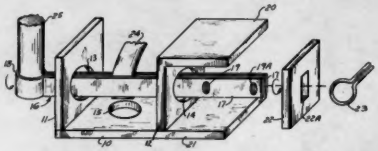
3,791,623

LOCKABLE TENSIONING DEVICE

Maynard L. Bozik, P.O. Box No. 976, Pompano Beach, Fla.

Continuation-in-part of Ser. No. 112,528, Feb. 4, 1971, abandoned. This application May 17, 1972, Ser. No. 253,944
Int. Cl. A63b *61/04*
U.S. Cl. 254—51 **7 Claims**

An anchored frame member having at least one protruding flange at one end, a rotatable axial member for tensioning flexible elements such as wire, rope, cable or the like inserted through apertures in said anchored frame, and a removeable locking member connectable to and coupled nonmoveably about said axial member and adjacent the frame flange, the



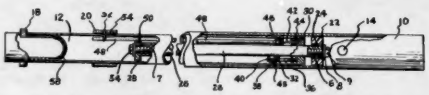
flange prevents the rotational motion of said locking member and said axial member.

3,791,624

EXTENDIBLE TUBE ASSEMBLY

Buford L. Payson, Garden Grove, Calif., assignor to Roberts Consolidated Industries, Inc., City of Industry, Calif.

Continuation of Ser. No. 186,085, Oct. 4, 1971, abandoned. This application Feb. 5, 1973, Ser. No. 329,458
Int. Cl. A47g *27/04*
U.S. Cl. 254—62 **9 Claims**



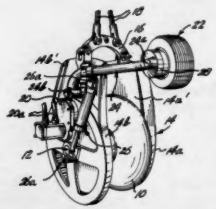
An extendible and locking assembly of telescoping tubular members is described which can be secured in a carpet stretcher system to provide a unique and highly efficient action in use of the stretcher. The assembly comprises a pair of telescoping tubes, one of which bears a lock tube and the other bears a sliding lock that fits about the tube and prevents retraction of the members. Manual release means are provided on the sliding lock to permit its release when the members are to be retracted. When used in a carpet stretcher assembly a unique "pump and pull" action results in which the stretcher head or the tubes can be extended simply by depressing and reaising the handle of the stretcher. This avoids the conventional and tedious shifting and relocating of the stretcher head. The assembly is preferably used in combination with a ratchet lock power stretcher.

3,791,625

FISHING NET HAULING SHEAVE DEVICE WITH POWERED PRESSER WHEEL SYSTEM

Johan P. Viljoen, Laaiplek, South Africa, assignor to Marine Construction & Design Co., Seattle, Wash.

Filed July 17, 1972, Ser. No. 272,460
Int. Cl. A01k *73/06*
U.S. Cl. 254—138 **10 Claims**



A fishing net hauling sheave device of the Puretic type is disclosed in combination with an assist wheel which is power

driven so as to maintain its surface speed at the speed of the net which it contacts and which is actuated so as to press against the net rounding the sheave under pressure which may be selectively adjusted so as to control the wheel's inhibiting effect on internal shearing tendency in the net passing over the sheave. Hydraulic controls and connections cause increase and decrease of power drive torque exerted by the wheel on the net coordinated with increase and decrease of wheel actuator pressure; furthermore, permit accommodation of hydraulic fluid back flow cause by reaction of the actuator in response to outward deflection movement of the wheel when passing over thickening sections of net.

3,791,626

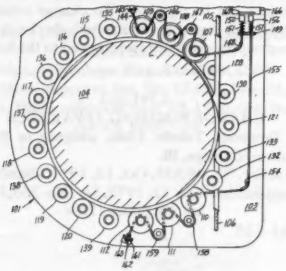
TRACTION TYPE HOIST

Carter H. Arnold, 317 Rocky Point Rd., Palos Verdes Estates, Calif.

Continuation-in-part of Ser. No. 69,709, Sept. 4, 1970, Pat. No. 3,707,275. This application Dec. 13, 1971, Ser. No. 207,374

Int. Cl. B66d *1/30*

U.S. Cl. 254—150 R **3 Claims**



A traction hoist of the type in which a rope is wound around a drum to provide a plurality of windings in side by side substantially parallel relationship. The shunting of the rope from one winding to the adjacent winding and the tensioning of the rope is accomplished by rollers so as to minimize power loss, provide automatic self-reeving action and to permit either end of the rope to be the tensioned end. Means is provided for indicating the presence of a damaged rope and for automatically shutting off the power in the event such damage is detected.

3,791,627

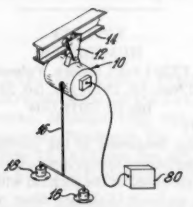
PNEUMATICALLY-OPERATED HOIST WITH AUTOMATIC CONTROL SYSTEM

Charles W. Stone, Garden City, and Edward L. Foster, Rochester, both of Mich., assignors to D. W. Zimmerman Mfg., Inc., Madison Heights, Mich.

Filed Sept. 20, 1971, Ser. No. 181,964

Int. Cl. B66d *1/00*

U.S. Cl. 254—168 **15 Claims**



A pneumatically-operated hoist is operated through an automatic, pneumatic control system. The operation of the hoist is initiated through an external signal for the pneumatic control system by means of which the hoist is automatically directed through a plurality of sequential steps. The hoist preferably has at least two remotely-positioned bleed elements which are operated through the pneumatic control elements to control the hoist pressure at predetermined values in a manner such that an operator can manipulate a load with the hoist in a desired manner without having to operate any manual controls at all. The control system also is equipped with a bleed element which opens to slowly bleed the hoist in the event of air failure, so that a load carried by the hoist can be safely lowered.

3,791,628

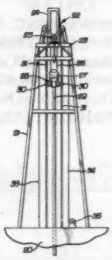
MOTION COMPENSATED CROWN BLOCK SYSTEM

Jerome Q. Burns, La Mesa, William C. Green, and Jack I. McLelland, both of Palos Verdes, all of Calif., assignors to Ocean Science and Engineering, Inc., Long Beach, Calif.

Filed July 26, 1972, Ser. No. 275,354

Int. Cl. B66d *1/48*

U.S. Cl. 254—172 **19 Claims**



A motion compensated crown block system in which a crown block sheave means is movable along a vertical path defined by a framework usually forming part of a drilling rig which is supported on a vessel. The crown block sheave assembly, which carries the hook load, is principally supported by inclined fluid pressure cylinder and piston means having one of their ends pivotally connected to the sheave means and their other ends pivotally connected to the framework in lateral spaced relation to the generally vertical pathway of the sheave means. Changing inclination of the cylinder and piston means during relative movement of the crown block sheave assembly and vessel provides variation in the piston reaction vertical force component which is caused to be nearly proportional to the change in fluid pressure in the cylinder and piston means. Load variation of less than 5 percent of the hook load is achievable over the full path of travel of the sheave means and is in the order of 2 percent over a major portion of said path in which the crown block sheave assembly travels. Means for sensing motion of the crown block sheave means relative to the sea bed are also provided so that the crown block sheave means will be virtually stabilized to maintain unchanged relation with respect to the sea bed during heaving of the vessel as caused by wind and wave action. Means are also provided for reducing to a minimum travel of the sheave cables over idle sheaves during travel of the crown block sheave means in its vertical path.

3,791,629

VIBRATOR ROLLER

Fulton J. Best, 1072 Kipling Ave., Islington, Ontario, Canada

Filed Sept. 5, 1972, Ser. No. 286,135

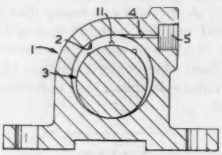
Claims priority, application Canada, Oct. 28, 1971, 126327

Int. Cl. B01f *1/00*

U.S. Cl. 259—1 R **5 Claims**

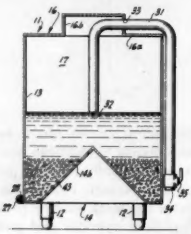
A vibrator including a housing forming a cylindrical chamber, a roller located in the chamber and having a smaller diameter than the diameter of the chamber, air inlet and outlet

means to and from the chamber respectively located to cause the roller to roll around the wall of the chamber when air is supplied to said inlet means, said roller having a cylindrical shell with a transverse web extending across the interior of the



shell mid-way between the ends of the shell, and secondary masses retained within the shell on opposite sides of the transverse web, the centre of gravity of said masses and hence of said roller being spaced from the central longitudinal axis of the shell.

3,791,630
APPARATUS FOR WASHING, COOLING AND SEPARATING FOOD PRODUCTS
Horace Hinds, Jr., Mountain View, Calif., assignor to Grace Machinery Company Incorporated, Santa Rosa, Calif.
Filed Mar. 19, 1971, Ser. No. 126,079
Int. Cl. B01f *5/10;* **A01j** *25/11*
U.S. Cl. 259—4 **7 Claims**

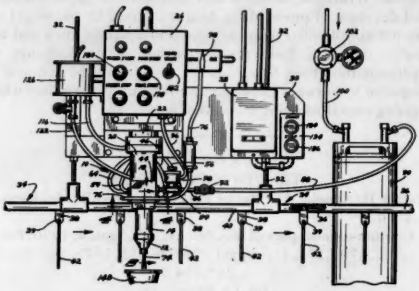


Process and apparatus for separating, washing and/or cooling food products wherein food particles transported in a fluid are introduced into the lower portion of a processing chamber. Fluid is passed upwardly through the particles and removed from the upper portion of the chamber, while the particles remain in the lower portion of the chamber. The particles are cooled by washing them with fluid at successively lower temperatures, and a single volume of fluid can be used for successive washes to minimize waste disposal, or to result in so little waste that it could be concentrated and dried.

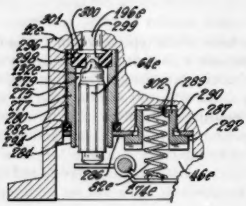
3,791,631
METHOD AND APPARATUS FOR MAKING COLORED EXPANDED FOAM ARTICLES
Maurice J. Meyer, St. Paul, Minn., assignor to MM Industries, Inc., St. Paul, Minn.
Filed Feb. 17, 1972, Ser. No. 227,230
Int. Cl. B01f *7/24*
U.S. Cl. 259—8 **2 Claims**

Colored expanded polyurethane foam articles are made by simultaneous discharging of measured amounts of isocyanate A, a suitable resin B, and a color pigmented liquid C into a mixing chamber in which is situated a rapidly rotating mixer. The mixed charge resulting flows by gravity into the lower section of an article mold. A mating upper section has a bleed hole through the top and is clamped onto the lower section until the resulting foam has risen and set. The mold sections are unclamped and the article ejected from the lower mold section by striking on an ejector pin slidably mounted in the bottom of the lower mold.

Apparatus for mixing and delivering this charge of urethane foam to the mold typically includes a mixing head to simultaneously deliver the two liquids A and B to the mixing chamber to be mixed and discharged into a mold. By simultaneously adding the color pigmented liquid C to this chamber through a supply conduit and the mixing head, a uniformly colored charge can be obtained. To change colors, only the supply conduit for liquid C is detached, the head flushed out and a second supply conduit C is attached to the head.



3,791,632
CHARGE FORMING APPARATUS
Daniel L. Donovan, Toledo, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.
Division of Ser. No. 79,855, Oct. 12, 1970, abandoned. This application Apr. 12, 1973, Ser. No. 350,370
Int. Cl. F02m *17/04*
U.S. Cl. 261—35 **8 Claims**

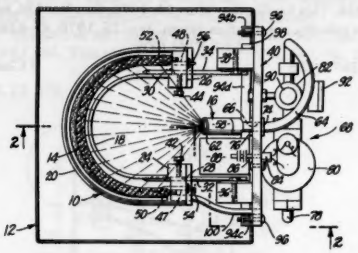


The disclosure embraces a charge forming apparatus or carburetor having a body embodying a guide and valve seat construction for a fuel inlet valve, the valve guide being disposed to seal off porosity adjacent the inlet valve region of the body of the charge forming apparatus or carburetor to prevent seepage or leakage of liquid fuel through a porous region that may exist or be uncovered by processing operations on the carburetor body.

3,791,633
HUMIDIFIER
Ronald C. Lowe, 23203 Via Calisero, Valencia, Calif.
Filed Nov. 24, 1971, Ser. No. 201,938
Int. Cl. B01f *3/04*
U.S. Cl. 261—101 **5 Claims**

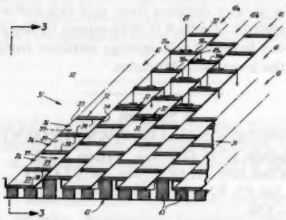
A humidifier for mounting in the plenum of a forced air heater and/or conditioner comprising an elongated U-shaped pan horizontally mounted in the plenum with an upwardly and slightly inwardly inclined U-shaped filter member supported therein. A spray nozzle for generating a wide-angle, flat spray is supported in the plenum opposite the filter member to direct a liquid spray across the plenum and onto the filter

member transverse to air flowing upwardly in the plenum. The spray is designed to have a velocity and density relative to the



upwardly flowing air sufficient to redirect the air into and through the filter member.

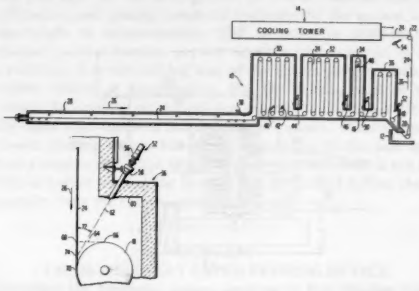
3,791,634
CROSS FLOW TOWER FILL OF CELLULAR CONSTRUCTION
Peter M. Phelps, 15 Buckeye Way, Kentfield, Calif.
Continuation-in-part of Ser. No. 13,875, Feb. 25, 1970, abandoned. This application Apr. 29, 1970, Ser. No. 32,995
Int. Cl. B01f *3/04*
U.S. Cl. 261—111 **1 Claim**



A crossflow tower (e.g., for water cooling) which incorporates packing formed by a number of superposed adjacent cellular units. The principal planes of each unit are generally parallel and inclined at a substantial angle, such as 5° to 70° to the horizontal. Each unit includes a gridwork of horizontally open stacked cells forming substantially horizontal liquid splash plates. The above inclined units are stacked against each other substantially throughout the fill assembly. Each plate is vertically offset from proximal plates so that the open edges of an upper plate overhang intermediate portions of lower plates. Liquid gravitating onto the lower plates forms a film which is contacted by crossflowing air for efficient air-liquid contact.

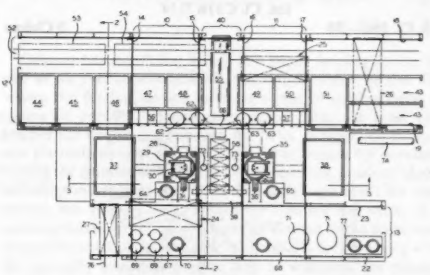
3,791,635
DETECTION OF RADIANT ENERGY EMITTING FROM A MOVING WEB OF METAL
Crayton H. Schwestka, Michigan City, Ind., assignor to National Steel Corporation, Pittsburgh, Pa.
Filed May 22, 1972, Ser. No. 255,265
Int. Cl. C21d *9/56*; **G01j** *5/00*
U.S. Cl. 266—3 R **11 Claims**

A metal web treating line includes rolls defining a travel path and a radiation pyrometer aimed at the travel path and into the wedge shaped space formed by the relationship of a roll and the travel path. Such aiming eliminates errors produced by changes in emissivity and extraneous radiation



thereby providing reliable temperature measurements suitable for process control.

3,791,636
STEEL MILL MELT SHOP ARRANGEMENT
Charles H. Anderson, McMurray, Pa., assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa.
Filed Nov. 15, 1971, Ser. No. 198,573
Int. Cl. C21c *5/52*
U.S. Cl. 266—13 **7 Claims**

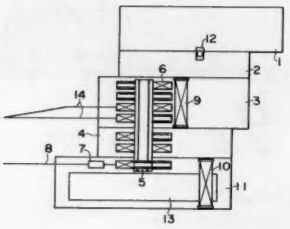


The duty cycle of electric furnaces is improved by locating each furnace in an individual bay. Each furnace bay has an overhead crane which runs on tracks that are parallel with the tracks of a similar crane in a juxtaposed bay. The corresponding ends of each set of tracks extend respectively across scrap and service bays the latter two of which are at right angles to the furnace bays. The service bay also serves as a melt transfer bay. The arrangement is such that each individual furnace bay crane can service its own furnace in respect to scrap input and melt output and other services without interference by the other. The duty cycle of each furnace is thereby maximized because none of the services required by one furnace is ever delayed by reason of waiting for a crane that is servicing the other furnace.

3,791,637
INGOT MAKING EQUIPMENT FOR STEEL MAKING WORKS
Kazuo Saigo, Wakayama City, and Kazumasa Nakamura, Kitakyushu City, both of Japan, assignors to Sumitomo Metal Industries Limited, Osaka City, Japan
Filed Mar. 23, 1972, Ser. No. 237,412
Claims priority, application Japan, Dec. 23, 1971, 46-2504; Mar. 24, 1971, 46-21097
Int. Cl. C21c *5/00*
U.S. Cl. 266—13 **4 Claims**

This disclosure relates to an ingot making apparatus for steel making works wherein the size of the steel making works

is made small, idle working spaces are eliminated, carriages can be moved at a high efficiency, the positions of rails for



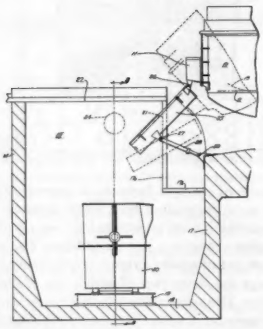
running the carriage and rails of a traverser can be quickly and accurately adjusted and a high efficiency operation can be attained.

3,791,638

METAL POURING ORGANIZATION

John T. Evans, Jr., Los Angeles, Calif., assignor to Armco Steel Corporation, Middletown, Ohio

Filed Nov. 8, 1972, Ser. No. 304,857
Int. Cl. C21b 7/14
U.S. Cl. 266—38 **3 Claims**



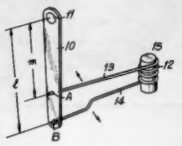
The application discloses a metal pouring organization which makes it possible to pour a melt while evacuating the attendant fumes for air pollution treatment. It comprises a pit below floor level adapted to accommodate a pouring ladle below floor level. A furnace is mounted for rocking movement above floor level and it is provided with a short pouring spout to which a launder is articulated, the other end of the launder being articulated to a support arm, wherein the parameters are such that, during tilting movement of the furnace during a pour, the discharge end of the launder will always be positioned to discharge the molten metal near the center of the ladle. The pit is provided with a powered removable cover which may be retracted to permit insertion of the ladle and then moved back into position. The launder enters the pit through a notch in a wall of the pit and the pit is provided with a duct through which effluent may be evacuated for air pollution control treatment.

3,791,639

SPRING-ACTUATED MECHANISM

Katsuhiko Nomura, Kawagoe, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 107,886, Jan. 20, 1971, Pat. No. 3,680,458. This application Mar. 22, 1972, Ser. No. 236,865
Claims priority, application Japan, Jan. 26, 1970, 45-6265
Int. Cl. F16f 1/06
U.S. Cl. 267—155 **5 Claims**



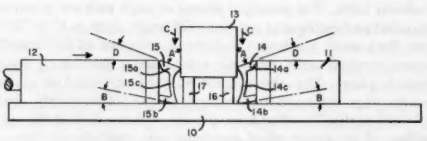
A spring-actuated mechanism particularly adapted for use in a single-lens reflex camera for actuating a tiltable reflector and diaphragm lever thereof. The mechanism includes a lever assembly supported for swinging movement about a given axis in a plane normal to the latter axis. A single spring, such as a coil spring, has a pair of elongated springy portions, which may form elongated free end portions of the coil spring respectively acting on the lever assembly to urge the latter in opposite directions about the above axis. One of the springy portions of the single spring is situated at a greater distance from the axis than the other, so that the lever assembly will be urged to turn about the axis by that one of the springy portions which is at the greater distance from said axis and with a moment the magnitude of which is determined by the difference in the distances between said springy portions from the axis about which the lever assembly turns.

3,791,640

COMPRESSION HOLD-DOWN ELEMENTS

Robert G. Clugage, 6718 Oak Ave., Felton, Calif.

Filed July 21, 1972, Ser. No. 273,971
Int. Cl. B23q 3/02; B25b 1/24, 5/16
U.S. Cl. 269—136 **1 Claim**



Workpiece hold-down elements for holding the workpiece between the jaws of a machine vice in such a way that the bottom of the workpiece is firmly pressed against the top of the parallel elements. For this purpose the hold-down elements are of channel shape with the top and bottom portions thereof downwardly sloping. The web connecting these portions is slightly curved so that when the workpiece is clamped between the top portions of opposing hold-down elements and pressure is applied by the vice, the webs of the hold-down elements flex slightly and sufficiently to press the bottom surface of the workpiece firmly against the parallel supports positioned beneath the workpiece.

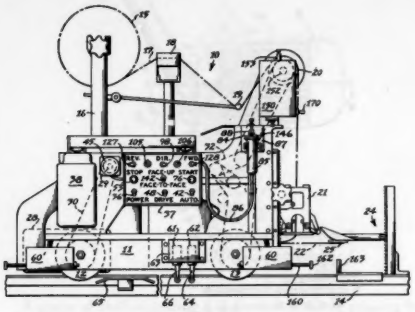
3,791,641
ELECTRICALLY CONTROLLED CLOTH SPREADING MACHINE

Robert W. Benson; James Ronald Chapman; Robert G. Reed, and Hoyt L. Smith, all of Nashville, Tenn., assignors to Cutters Machine Company, Inc., Nashville, Tenn.

Division of Ser. No. 857,509, Sept. 12, 1969, Pat. No. 3,663,006. This application Feb. 25, 1972, Ser. No. 229,604

Int. Cl. B65h *29/46*

U.S. Cl. 270—31 **5 Claims**



An electrically driven and controlled cloth spreading machine including means for reversing the travel of the machine, means for controlling the high and low speeds of the machine, means for causing the machine to fail safe at low speed upon power failure and open circuit conditions caused by different changes in function of the machine.

The machine is also provided with various selective controls for manual, semi-automatic and automatic operation of the machine, and for spreading cloth face-to-face, face-up or face-down.

3,791,642
SHEET FEEDER FOR PRINTING PRESSES

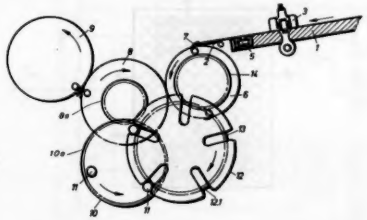
Hans-Bernhard Bolza Schunemann, Wurzburg, Germany, assignor to Schnellpressenfabrik Koenig & Bauer Aktiengesellschaft, Wurzburg, Germany

Filed Dec. 22, 1971, Ser. No. 210,897

Claims priority, application Germany, Dec. 24, 1970, 2063818

Int. Cl. B65h *5/12*

U.S. Cl. 271—236 **4 Claims**



The invention relates to a sheet feeding mechanism for printing presses with rotating pregripper. The mechanism provides considerably higher machine speeds. A rotating pregripper is driven by a Maltese cross transmission such that there is a relatively short resting time on a relatively long acceleration angle. The rotating pregripper is equipped with grippers which withdraw under its surface. The pregripper is located under a sheet feeding table having front lays which come from below a throw on aligning or pre-aligning device in covered state. Side lays in covered state are provided on the table along with a sheet displacing mechanism for releasing the side lays. By the arrangement of this mechanism the acceleration and braking times are increased by the square, i.e., quadruple to approximately 200° in order to achieve the desired motion features yet not result in higher forces of acceleration. For the shifting way of the sheets yet not result in higher forces of acceleration. For the shifting way of the sheets the rotating pregripper has means for laterally shifting the same after throwon and until sheet transfer. This last mentioned shifting means has means responsive to the side lays being used so that when lateral alignment of the sheet is not attained before leaving the front lays it is reached before sheet transfer from the rotating pregripper.

3,791,643
CHAIN DELIVERY PAPER FEEDING DEVICE

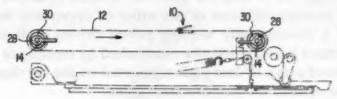
Haruhiro Ito, Iwatsuki, Japan, assignor to Fuji Shashin Koki Kabushiki Kaisha, Saitama, Japan

Filed Dec. 2, 1971, Ser. No. 204,080

Claims priority, application Japan, Dec. 12, 1970, 45/123591

Int. Cl. B65h *29/04*

U.S. Cl. 271—204 **Claims**



Gripper bar stabilizing means in a paper feeding device for use in an electrophotographic copying machine or the like where the feeding device includes a pair of endless belts or chains in parallel, spaced-apart relationship, at least one gripper bar connected between the belts, at least one gripper arm pivotally mounted on the gripper bar, means for normally biasing the gripper arm against the gripper bar, a pair of shafts including means disposed at the ends of each shaft for supporting the endless belts, means for rotating the shafts in a predetermined direction to impart movement to the belts; cam means disposed on at least one of the shafts for co-acting with the pivotally mounted gripper arm to withdraw the gripper arm from the gripper bar to thereby facilitate the transfer of paper from or to the feeding device and where the stabilizing means is attached to the one shaft and attracts the gripper bar to the stabilizing means while the cam means co-acts with the gripper arm to thereby prevent deflection of the gripper bar and thus maintain the gripper bar in a fixed position.

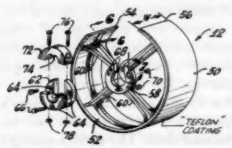
3,791,644
SHEET HANDLING APPARATUS

Howard W. DeMoore, 3725 Bentley Ave., Los Angeles, Calif.

Continuation-in-part of Ser. No. 141,681, May 10, 1971, abandoned. This application Dec. 14, 1972, Ser. No. 315,125

Int. Cl. B65h *29/20*

U.S. Cl. 271—80 **7 Claims**

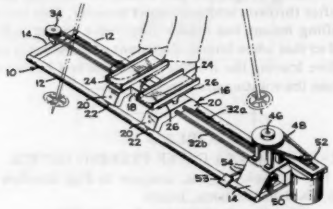


A skeleton wheel for a printing press has an ink-repellent, circumferential surface formed of polytetrafluoroethylene, the surface having substantial width in the direction of the wheel axis.

3,791,645
SKI-SIMULATOR TRAINING APPARATUS

Nick L. Stelma, Rt. 1, Ione, Calif.

Filed Sept. 28, 1972, Ser. No. 292,919
Int. Cl. A63b 69/18
U.S. Cl. 272—57 B 5 Claims

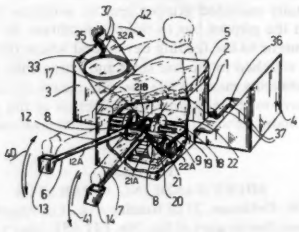


Ski-simulator training apparatus including a track supporting a carriage for to and fro powered motion resultant from frictional contact with one or the other of oppositely moving flights of a continuously moving power driven endless belt which contact is automatically established by turning or canting motion of a pair of foot pads supported on the carriage and adapted to receive the feet of a ski trainee.

3,791,646
EXERCISING AND TEACHING APPARATUS FOR LIMB TRAINING AND FOR TEACHING SWIMMING

Albano Marchignoni, Mura D'Azeglio 4, Bologna, Italy

Filed Sept. 27, 1971, Ser. No. 183,806
Claims priority, application Italy, Sept. 30, 1970, 3564 A/70
Int. Cl. A63b 69/10
U.S. Cl. 272—71 6 Claims

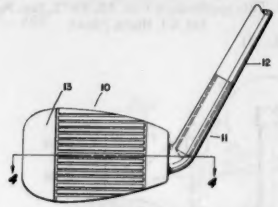


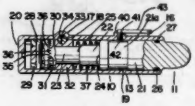
A self-training exercising device to develop the proper limb movement for swimming comprising a central box support and two triangularly shaped arm units, all of which enclose a geared wheel mechanism, chain drive and reduction gear linked by the chain drive to a horizontal bearing shaft, the user of the device placing his body on the box support and stretching his arms to the arm units. The user's legs fit into reciprocating adjustable lever-supported foot rests which are attached to a horizontal shaft. The recirpocating leg levers and leg supports move alternately along vertical planes parallel to each other to provide the proper leg movement for crawl stroke and back stroke and the hand movements are carried out by movement of the arms which grasp a handle member moving along an elliptical track or guideway. A motor serves to drive the leg and arm levers.

3,791,647
ADJUSTABLE HEAD GOLF CLUB FOR RIGHT AND LEFT HANDED PLAYERS

Joseph Verderber, 15255 Lake Shore Blvd., Cleveland, Ohio

Filed July 24, 1972, Ser. No. 274,171
Int. Cl. A63b 53/06
U.S. Cl. 273—79 5 Claims



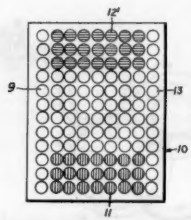


A golf club is provided having an adjustable head which may be moved to a position for use as a putter or any one of eight different irons. It may be used optionally as a right or left-handed club, has embodied therein novel means for easily and efficiently locking the club head in any of its selected positions in relation to the shaft of the club, and a novel arrangement of readily visible index marks and graduations for enabling the club head to be quickly moved to a selected position, and consists of a minimum number of parts of simple construction, which can be manufactured at low cost, and can be quickly and easily assembled without excessive use of tooling.

3,791,648
BOARD GAME APPARATUS

David N. Patterson, Box 306, Edinboro, Pa.

Filed Feb. 28, 1972, Ser. No. 229,830
Int. Cl. A63f 3/00
U.S. Cl. 273—131 AB 1 Claim



A game apparatus comprising a board with a playing surface made up of circular spaces disposed about the board in 12 ranks and 9 files. Two shaded areas at opposite ends of the playing surface are the starting and objective spaces for the opposing teams. The cylindrical playing pieces are marked by team (color) and by playing values (dots) on each end. The one end is solid color (e.g., red), the other end is the other team's color (e.g., blue), with a ring of the first team's color around the piece to indicate a captured piece. Play runs through a series of "turns" determined by the roll of two dice

until one player has moved all his pieces into his objective shaded area or has filled all the spaces in his objective shaded area.

3,791,649

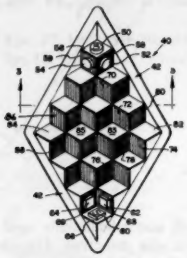
THREE-DIMENSIONAL BOARD GAME APPARATUS

Nicholas Gold, 72 Morningside Dr., Arlington, Mass.

Filed Mar. 8, 1972, Ser. No. 232,849

Int. Cl. A63f 3/00

U.S. Cl. 273—131 AD **23 Claims**



A game of skill including a three-dimensional playing board and opposing playing pieces adapted to be moved according to predetermined rules on said playing board to achieve a winning objective. The board is generally diamond shaped and includes three groups of square playing spaces, the playing spaces of each group having surfaces located in parallel planes perpendicular to the planes of the playing spaces of the other two groups. Each playing space is joined to at least a playing space of each of the other groups at two of its edges to form a multiplicity of cube corners. The game pieces and game board cooperate to hold the game pieces in playing spaces regardless of the orientation thereof.

3,791,650

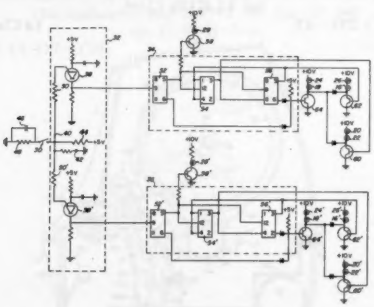
SIMULATED DICE GAME AND CONTROL CIRCUIT THEREFOR

Dennis D. Dice, Yadkinville, N.C., assignor to Elecronic Data Controls Corporation, Salem, N.C.

Filed May 15, 1972, Ser. No. 253,057

Int. Cl. A63b 71/06

U.S. Cl. 273—138 A **2 Claims**



A simulated dice game including a playing board on which is presented a display including lamps arranged in a pattern corresponding to the spot patterns on two dice. A manually operated switch button is provided to activate and deactivate pulse generating devices for each lamp arrangement, and the generated pulses are fed to counter circuits that are switched through a predetermined recurring sequence of operating states which selectively energize the lamps through output circuitry to show combinations of one to six lamps on each die. The pulse generating device produces triggering pulses at a relatively low frequency and at a constant repetition rate during activation thereof by the switch button and produces such pulses at a descending repetition rate upon deactivation thereof by the switch button whereby the lamps flash visibly during activation and continue to flash at a descending repetition rate upon deactivation until a final operating state is displayed upon cessation of pulse generation.

3,791,651

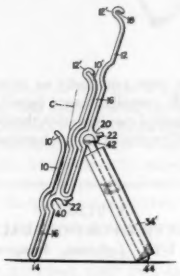
CARD HOLDER

Donald W. Barnum, 1090 N.W. Chestnut St., Salem, and Richard L. Barnum, 9545 S.W. 62nd Dr., Portland, Oreg.

Filed July 13, 1972, Ser. No. 271,383

Int. Cl. A63f 1/10

U.S. Cl. 273—150 **11 Claims**



A holder for displaying playing cards, greeting cards and the like includes interconnected front and back curved plates spaced apart to provide a curved card-retaining slot which functions to bend the cards sufficiently to retain them in the slot by frictional engagement with the plates. The front plate is shorter than the back plate to allow the cards to extend upwardly beyond the front plate for viewing. The holder is provided with spaced sockets on its rearward side for interconnection of a plurality of holders to provide a composite assembly. The holder is supported by a support which, in one embodiment, is a brace extending rearwardly of the holder and, in a second embodiment, is a base mounting the holder for pivotal adjustment between upright and collapsed positions.

3,791,652

DIMPLE MARK REPAIR DEVICE AND BALL MARKER COMBINATION WITH GOLF CLUB

Gerald J. Schuler, 3233 Freemansburg Ave., Easton, Pa.

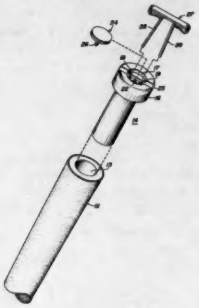
Filed Mar. 27, 1973, Ser. No. 345,448

Int. Cl. A63b 53/00

U.S. Cl. 273—162 D **2 Claims**

A ball marker and a dimple mark repair device for repairing damage done to the turf by a golf ball are held in the handle of a golf club such as a putter. The combination includes an integrally formed cylindrical closure plug which adheredly engages within the wall of a bore in the golf club handle. The plug has a flanged collar at one end thereof and includes a central axial bore at the flanged end for receiving a central depending stem of a golf ball marker. The plug also has a pair of longitudinally oriented bores extending therethrough from the flanged end, in such a manner that the longitudinal oriented bores are spaced with respect to the central axial bore so that the central axial bore is oriented midway between the longitudinal bores, the axes thereof all lying in the same plane. The plug has a central axial recess at the end for receiving a golf ball marker or a coin therewithin. The plug has a groove at the end which extends across the diameter of the plug along a line

intersecting the axes of the longitudinally oriented bores. The dimple mark repair device includes an integrally formed member having a pair of spring biased tongs which are adapted to frictionally engage within the longitudinal oriented bores. Portions are bent outwardly so as to seat in the plug groove and protrude a small distance beyond the flange collar so as to facilitate manual manipulation thereof. The member is bent around at 180° angles to form a horizontal bar parallel to the portions.



3,791,653

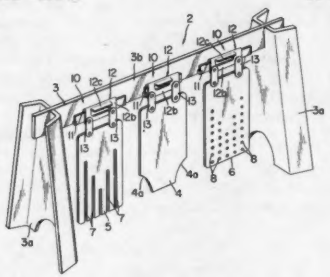
TRAINING DEVICE FOR GOLF BALL PUTTING

Nobuo Yamada, 1-13, 1-chome, Imagawa, Suginami-ku, Tokyo-to, Japan

Filed July 26, 1972, Ser. No. 275,779

Int. Cl. A63b *69/36*

U.S. Cl. 273—185 R **10 Claims**



A training device for golf ball putting, comprising a support frame having a horizontal beam, a central target suspended from the beam, and side targets also suspended from the beam at both sides of the central target, to produce a sound when hit by a golf ball. These targets have different acoustic characteristics so that when hit they make different sounds which serve to judge the course of the ball without looking at the ball. The device includes means for suspending the targets, including a bracket and at least two fittings for the targets. The device may have secondary or convenience features incorporated therein.

3,791,654

METHOD OF DEVELOPING A PROPER GOLF CLUB SWING

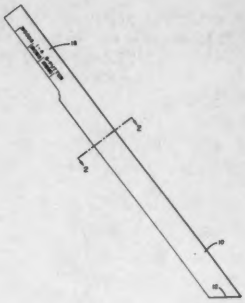
Geno Lupinacci, 280 W. Hill Rd., Stamford, Conn.

Filed Oct. 24, 1972, Ser. No. 299,793

Int. Cl. A63b *69/36*

U.S. Cl. 273—186 A **1 Claim**

In accordance with the golf swing training method disclosed a person learns the proper way to swing a conventional golf club by practicing swinging a special practice club which is of approximately the same length as a conventional club, but substantially lighter and is flexible throughout in one direction normal to its length and substantially rigid in a direction at right angles to said one direction. The club is swung in a manner such that the club will flex in the direction of the swing path if the swing is executed with the exertion of undue swing force, otherwise the club will not flex.



3,791,655

SOLID RUBBER GOLF BALL

George C. Schweiker, Parkersburg, W. Va., and John W. Jepson, Marion, Mass., assignors to Acushnet Company, New Bedford, Mass.

Filed Dec. 1, 1971, Ser. No. 203,856

Int. Cl. A63b *37/00;* **C08c** *11/06;* **C08d** *11/00*

U.S. Cl. 273—218 **7 Claims**

A solid rubber golf ball is disclosed. The golf ball is made from a composition comprising polybutadiene and an unsaturated carboxamide cross-linking said polybutadiene with hydrogen bonding.

3,791,656

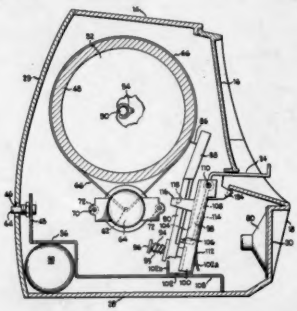
PHONOGRAPH INDEX MEANS

Gunars Licitis, Lombard, Ill., and Gerald M. Rodmaker, Cincinnati, Ohio, assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Sept. 21, 1972, Ser. No. 290,971

Int. Cl. G11b *17/06*

U.S. Cl. 274—17 **14 Claims**



Apparatus for indexing a stylus relative to any of a plurality of recording bands on a record. The apparatus includes an elongated tone arm mounting a stylus and which is received in a bridge on an indexing arm movably mounted for indexing relative to a record. The tone arm is connected to the indexing

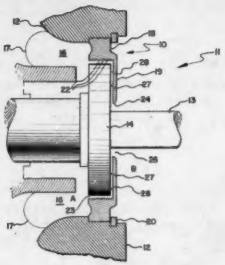
arm by means of a connection which permits pivotal movement of the tone arm relative to the indexing arm. The indexing arm itself is pivotally movable about an axis perpendicular to the tone arm pivot axis for moving the stylus away from the record. The tone arm is thus moved away from the record and to a predetermined position on the indexing arm which then may be moved to a desired band on the record.

3,791,657

DYNAMIC LIP SEAL

Richard E. Bilski, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed Apr. 27, 1972, Ser. No. 248,152
Int. Cl. F16j *15/42, 15/44*
U.S. Cl. 277—53 **4 Claims**



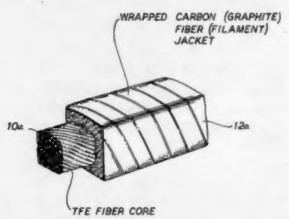
An annular L-shaped seal member spacially surrounding a rotatable shaft collar, the seal having an axial portion contiguous with the shaft collar periphery to form an axial labyrinth for fluid flow from a higher pressure side to a lower pressure side of the collar, and an integral radial portion axially displaced on the low pressure side of the collar to form a radially inward extension of the fluid flow channel to impede the fluid flow therethrough by the centrifuge of fluid undergoing viscous shear during rotation of the collar.

3,791,658

PACKINGS FOR PUMPS, VALVES, AND THE LIKE

Julio Zumeta, New York, N.Y., and Edward M. Case, Weston, Conn., assignors to The Marlo Company, Inc., New York, N.Y.

Continuation of Ser. No. 688,806, Dec. 7, 1967, abandoned. This application May 7, 1971, Ser. No. 141,448
Int. Cl. F16j *15/10*
U.S. Cl. 277—230 **7 Claims**



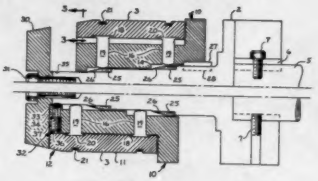
A packing for fluid-tightly sealing movable elements of pumps, valves, and the like. The packing comprises an inner Teflon-(a trade mark hereinafter referred to as TFE) containing core and an outer carbon-containing jacket surrounding the core. This core may be made of TFE fiber or of a TFE-impregnated packing material such as asbestos or fiberglass, while the outer jacket can be composed of graphite filament either wrapped or braided around the core.

3,791,659

EXPANDABLE CHUCK OR MANDREL

William Medford Hardin, Clyde, N.C., assignor to Champion International Corporation, Hamilton, Ohio

Filed Nov. 17, 1972, Ser. No. 307,659
Int. Cl. B23b *31/42*
U.S. Cl. 279—2 **6 Claims**



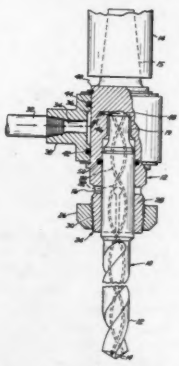
An expandable chuck or mandrel is especially well suited for use in winding and machines of the sort used in paper manufacturing operations has a stepped spindle located within the borehole of the mandrel body which spindle provides tapered cam surfaces which cause the mandrel jaws to expand and contract responsive to reciprocal movement of the body of the mandrel on the spindle or vice versa.

3,791,660

DEVICE FOR GRIPPING, DRIVING AND SUPPLYING COOLANT TO A CUTTING TOOL HAVING COOLANT PASSAGES THEREIN

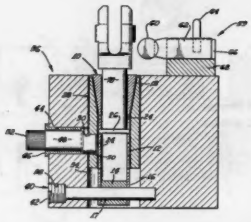
Robert J. Bostley, Turners Falls, Mass., assignor to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 137,901, April 27, 1971, abandoned. This application Jan. 9, 1973, Ser. No. 322,272
Int. Cl. B23b *31/00, 51/06*
U.S. Cl. 279—20 **2 Claims**



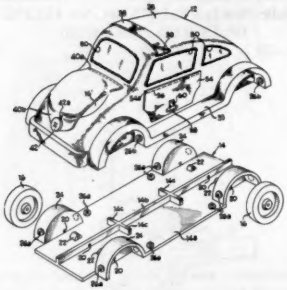
An oil conduit twist drill series and method of making are disclosed which have a common straight shank in each series and a tang drive so as to minimize machining costs, sealing problems, and eliminate the use of adapters involved with taper shank oil conduit drills and such drills which have varying diameter straight shanks.

3,791,661
COLLET AND COLLET FIXTURE
Charles E. Giles, 3654 Overland, Los Angeles, Calif.
Division of Ser. No. 168,106, Aug. 2, 1971, Pat. No. 3,751,027. This application Apr. 18, 1973, Ser. No. 352,100
Int. Cl. B23b 31/20
U.S. Cl. 279—43 2 Claims



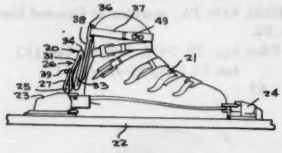
An improved collet and collet fixture provides an adjustable height for a work piece held in the collet so that the work piece may be held at the proper height. The collet is locked in position from the bottom by the fixture, thereby providing a secure location and holding of the collet and accurate machining of the work piece.

3,791,662
TOY VEHICLE WITH REMOVABLE SOFT BODY PORTION
Marvin I. Glass, Chicago; Howard J. Morrison, Highland Park, and Bette M. Kaelin, Chicago, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Feb. 22, 1972, Ser. No. 227,816
Int. Cl. B62d 11/00
U.S. Cl. 280—1.1 25 Claims



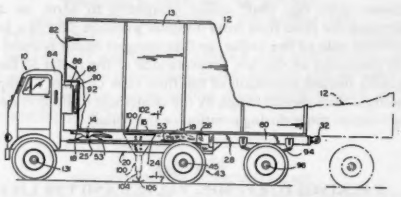
A toy vehicle which includes a body portion of soft cushion-type material shaped in the form of an automobile and on which a child may sit. The body portion is supported on a rigid base portion which has a plurality of wheels rotatably mounted thereon to permit the vehicle to be ridden by a child over a supporting surface such as a floor. The soft body portion is removably mounted by snap means on the rigid base portion to permit the body portion to be separated from the base portion and used by the child for a pillow or the like. The body portion has front and rear flexible flaps which are hingedly fixed to the body portion along one edge thereof to simulate front and rear hood or trunk lids. Side flaps are provided simulating doors. Pockets are provided beneath some of the flaps and the flaps are held down by buttons, buckles or the like. A spare wheel is disposed beneath one of the front or rear flaps to simulate a spare tire for the automobile and a simulated automobile motor is imprinted on the body portion beneath the other flap.

3,791,663
SAFETY STRAP RETAINER
Ivor J. Allsop; Jon I. Allsop; Michael G. Allsop, and James D. Allsop, all of P.O. Box 23, Bellingham, Wash.
Continuation-in-part of Ser. No. 191,313, Oct. 21, 1971. This application Sept. 22, 1972, Ser. No. 291,176
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35 N 7 Claims



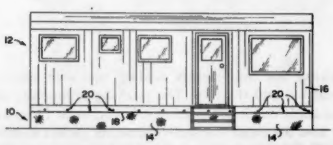
A safety strap retainer for ski boots that includes a member that is connected to a heel clamp whereby a ski boot will remain safely and conveniently connected to the ski.

3,791,664
SELF-LEVELER
Kenneth W. Self; Norman B. Chew, both of Lake Oswego, Oreg., and Bill I. Twyman, Vancouver, Wash., assignors to Freightliner Corporation, Portland, Oreg.
Division of Ser. No. 067,398, Aug. 27, 1970, Pat. No. 3,718,346. This application Dec. 11, 1972, Ser. No. 314,224
Int. Cl. B60g 17/04; B62d 53/06
U.S. Cl. 280—124 F 6 Claims



A vehicular assembly comprising a tractor and a semitrailer so detachably coupled together that they act as a unit, wherein the assembly has three zones of support, one of which is provided by a zero rate suspension means and the other two of which are provided by variable rate suspension means, whereby to maintain reasonably constant a desired pattern of load distribution between the three zones.

3,791,665
COVER ASSEMBLY
Charles R. McAvoy, 1002 E. Platt, Tampa, Fla.
Filed May 5, 1972, Ser. No. 250,605
Int. Cl. B60r 27/00
U.S. Cl. 280—150 R 7 Claims



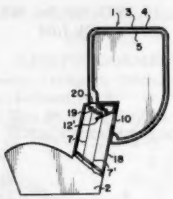
A cover assembly of the type designed for use in combination with house trailers, mobile homes or like structures com-

prising one or more skirt-like structures attached about the lower, outer peripheral portion of a house trailer and dimensioned to extend from this portion, vertically downward to approximately the supporting surface on which the mobile home is positioned. The skirt structure is made from a flexible, open meshed material capable of allowing air to pass therethrough and be rolled upon itself when removed from the mobile home. Connecting means are provided in the form of brackets arranged in spaced relation to one another and connected to the mobile home so as to position the skirt structure in abutting relation to the lower, outer peripheral portion of the mobile home. Attachment means comprising an integrally formed rib or a plurality of apertured flanges may be formed on the upper edge of the skirt structure to cooperate with connecting means so as to allow the skirt structure to be removably attached from the mobile home.

3,791,666
SAFETY DEVICE FOR VEHICLES SUCH AS AUTOMOBILES

Iwao Shibamoto, No. 31-7, 2 chome Nishi Sugamo Toshimaku, Tokyo, Japan

Filed Nov. 3, 1971, Ser. No. 195,183
Int. Cl. B60r *21/08*
U.S. Cl. 280—150 AB **2 Claims**

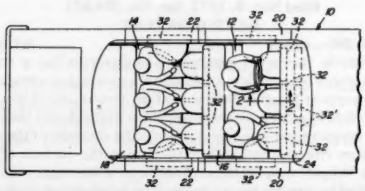


A safety device for automobiles, comprises a normally folded bag, an air column structure on said bag which is inflatable to expand said bag into its original shape at the time of collision of the automobile, means for inflating said air column structure, air passage openings for introducing external air into the interior of the bag therethrough in the process of expansion of said bag by virtue of the pressure differential between the interior and exterior of said bag and means for trapping the thus introduced air within said bag, said air passage openings being formed at a portion of the bag adjacent a mounting base on which said bag is mounted and being in communication with duct means formed in said mounting base.

3,791,667
RETRACTABLE VEHICLE PASSENGER CUSHIONING SYSTEM

Harold R. Haviland, 1038 Latty, Defiance, Ohio

Filed May 4, 1972, Ser. No. 250,326
Int. Cl. B60r *21/08*
U.S. Cl. 280—150 AB **9 Claims**

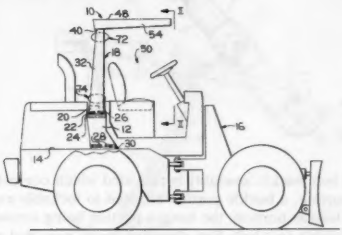


A plurality of individually or collectively actuatable air bag restraint devices for disposition both forward of and alongside of each passenger seating area within a vehicle. Each individual device is strategically located to provide the maximum cushioning effect with a minimum of obstruction within the passenger seating area within the associated vehicle. Each air bag restraint device includes a hollow open-sided housing designed for flush or recessed mounting in an associated vehicle body portion and the open side of the housing is covered by a fluid impervious stretchable membrane whereby the discharging of a selected gas under pressure into the housing will cause the membrane to be inflated and expanded outwardly of the open side of the housing to cushion any object moving in a direction toward the housing.

3,791,668
ROLL-OVER PROTECTION STRUCTURE WITH DEFORMABLE LEGS

Stanely B. Adams, Yorkville, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 14, 1972, Ser. No. 262,552
Int. Cl. B62d *25/06*
U.S. Cl. 280—150 C **5 Claims**

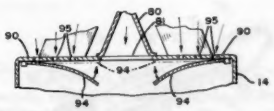


A roll-over protection structure having spaced upright legs including relatively rigid upper end portions, relatively rigid lower end portions secured to a vehicle frame, and central portions of reduced cross sectional areas from the end portions to absorb energy and predictably deform during a vehicle roll-over rather than having the legs fracture at their end portions to minimize the possibility of complete separation of the protection structure from the vehicle.

3,791,669
CONE ASPIRATING STRUCTURE FOR AIR CUSHION INFLATION

Brian K. Hamilton, Utica, Mich., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Aug. 16, 1972, Ser. No. 281,263
Int. Cl. B60r *21/10*
U.S. Cl. 280—150 AB **2 Claims**



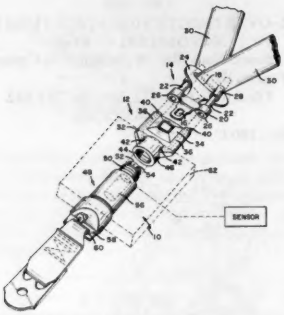
A gas bag assembly for vehicle occupant constraint upon impact of the vehicle. The gas bag assembly comprises an occupant protecting inflatable bag. The bag is partially filled with gas supplied by a gas source, such as stored gas or a gas generator, or a combination of the two, through a cone. The cone supplies gas to a diffuser which is in communication with the interior of the vehicle. Upon passage of inflating gas through the cone for inflation of the outer bag, the diffuser is supplied, because of pressure differential by the action of the

cone on the gas from the source, with air from the interior of the vehicle by aspiration.

3,791,670
BAND BUCKLE FOR USE WITH INFLATABLE SEAT BELTS

Richard W. Lucore, Rochester, and Robert L. Stephenson, Sterling Heights, both of Mich., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Sept. 21, 1972, Ser. No. 291,107
Int. Cl. B60r *21/08*
U.S. Cl. 280—150 AB **15 Claims**

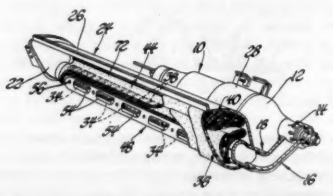


A seat belt buckle assembly is provided which comprises a tongue portion; a buckle portion adapted to lockably engage with the tongue portion; the tongue portion being connected to an inflatable seat belt; first chamber means provided in the buckle portion; second chamber means provided in the tongue portion and communicating with the inflatable seat belt; second chamber means being adapted to communicate with the first chamber means when tongue and buckle portions are lockably engaged; and inflating means communicating with the first chamber means, the inflating means including a gas source; whereby the inflating means and the inflatable seat belt are interconnected through the first and second chamber means when the tongue and buckle portions are lockably engaged so as to allow gas released from the gas source to pass through the first and second chamber means and inflate the inflatable seat belt.

3,791,671
OCCUPANT RESTRAINT SYSTEM

John F. Zens, Algonac, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 10, 1972, Ser. No. 305,444
Int. Cl. B60r *21/08*
U.S. Cl. 280—150 AB **3 Claims**

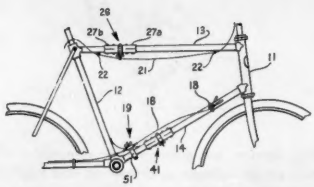


An occupant restraint system includes an inflator which supplies high temperature pressure fluid to a generally elongated hollow cylindrical diffuser. The diffuser includes two axially extending diametrically opposite flats and two radially spaced rows of slots, one row being in one flat and being divided into spaced groups, and the other row being between the flats. A torso cushion surrounds the diffuser and is fed from the other row of slots. A knee cushion fits within the torso cushion and has slits located transversely of respective groups of slots. A combined seal and heat shield member has an edge portion covering the one row of slots and has a flap portion covering the other row of slots. The member has slits indexed to the cushion slits. An elongated retainer plate within the knee cushion includes louvered openings equal in number to the groups of slots. Fixed studs extend through the knee cushion, seal, and diffuser and are threaded to tapped posts which extend through openings in the other flat of the diffuser. The edge portion of the member provides a seal between the knee cushion and the diffuser when the knee cushion is inflated to prevent flow of the pressure fluid from the knee cushion to the diffuser. The flap portion of the member is moved by the pressure fluid flowing through the other row of slots into the torso cushion into engagement with the knee cushion adjacent such other row of slots to protect the knee cushion from the high temperature pressure fluid.

3,791,672
FOLDING BICYCLE

Warren K. Pera, Oakland, Calif., assignor to Bell Fold-A-Bike, Inc., Orinda, Calif.

Filed Nov. 10, 1972, Ser. No. 305,611
Int. Cl. B62k *3/04*
U.S. Cl. 280—287 **9 Claims**



The frame of a bicycle is provided with a hinge on the top bar and a detachable joint on the diagonal bar to permit folding to reduce space for transportation and storage. So-called "10 speed" bicycles require installation of a pair of cables controlling speed changes clamped in a position extending alongside the diagonal bar and these cables must be taut when the bicycle is operative. Hence detachment of the diagonal bar and folding is prevented so long as the cables are clamped to the bar. In accordance with the present invention, the rearmost cable clamp is detachable from the diagonal bar so that the cables can bend when bar is disjointed.

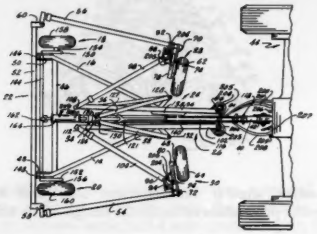
3,791,673
FOLDING MEANS FOR IMPLEMENT FRAME STRUCTURES

Michael C. Hornung, Spearville, Kans., assignor to American Products, Inc., Spearville, Kans.

Filed Nov. 8, 1972, Ser. No. 304,651
Int. Cl. B62d *53/00*
U.S. Cl. 280—411 A **6 Claims**

A foldable frame for agriculture implements has a frame section with a rear sectional foldable support beam transversely. The support beam is hinged to allow movement of the sections to fold in a forward position, when desired, and then unfold to an extended working position. The sections of the support beam rise and fall with variations in the surface of the ground. Wheels support the end sections of the support beam. The foldable support beam carries farm implements, such as a grain drill, and is pivotally connected at the end sections to a pair of forwardly extending converging folding link members which cooperate with the hinges of the support beam to allow

the end sections of the foldable support beam to be folded in a forward direction. A double acting hydraulic cylinder is mounted on a central longitudinal tongue of the frame with the rod thereof connected to a slide in turn connected to the folding link members to extend and retract same. The folding

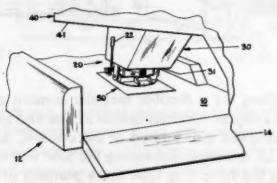


link members provide protected passageways for wheel operating fluid conduits. The end sections of the folding support beam, and thus the implement mounted thereon are maintained in a horizontal position with the central section of the support beam in both the folded and unfolded or extended position.

3,791,674
KINGPIN ASSEMBLY

Howard P. Berends, Fruitport, Mich., assignor to Holland Hitch Company, Holland, Mich.

Filed May 30, 1972, Ser. No. 257,576
Int. Cl. B62d *53/08*
U.S. Cl. 280—433 **19 Claims**



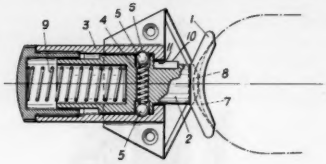
A kingpin assembly includes a kingpin pivotally coupled to recessed mounting means positioned with an aperture in a relatively flat surface of a vehicle. The kingpin is movable between a locked upright position during use to a horizontal stored position when not in use. A locking mechanism is also pivotally coupled to the recessed mounting means and provides the dual function of covering the recessed mounting means when the kingpin is in its stored position therein and locking the kingpin in the upright position during use. The locking mechanism includes a shoulder portion adapted to aid in lifting the kingpin from its stored position to its upright position.

3,791,675
SAFETY SKI BINDING

Johann Feichtinger, and Anton Feichtinger, both of Linz, Austria, assignors to Gertsch AG, Zug, Switzerland

Filed June 5, 1972, Ser. No. 259,545
Claims priority, application Austria, June 29, 1971, 5606/71
Int. Cl. A63c *9/00*
U.S. Cl. 280—11.35 T **8 Claims**

Safety ski binding presents a positive abutment for the toe of the ski boot together with means for preventing upward movement of the toe of the boot and cam-like means for resisting sideward movement thereof. Said last-named means resist sideward movement of the boot by spring-backed detent

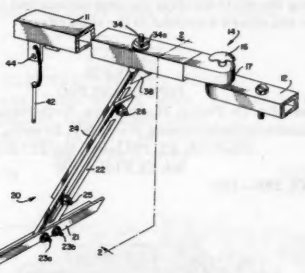


means having a spring return to normal operating position when the sideward thrust is removed.

3,791,676
TRAILER ATTACHMENT

James H. Spratlen, Asheville Rd., Beloit, Kans.

Filed Aug. 25, 1972, Ser. No. 283,628
Int. Cl. B60d *1/14*
U.S. Cl. 280—475 **4 Claims**



A method and apparatus for facilitating the rapid connection and disconnection of a trailer tongue from a vehicle tongue having a connection of the type which requires separation therebetween to achieve such coupling. The apparatus comprises a base member capable of resting on a surface, such as the ground, and an adjustable, extended member secured to the base member and having a predetermined length. Means are provided for pivotally securing the base member and the extended member to the trailer tongue so that upon lateral movement of the trailer tongue and the vehicle tongue, the extended member causes the trailer tongue to uplift relative to the vehicle tongue as a result of the rotation of the adjustable member about the base member. The length of the extended member is selected to define a length sufficient to cause separation of the respective tongues. The apparatus also includes a support member for supporting the trailer tongue in a stable position after separation from the vehicle tongue. The method of connecting and disconnecting the respective tongues is also disclosed.

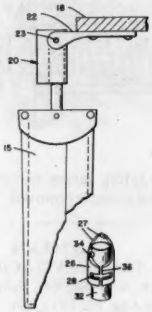
3,791,677
TELEPHONE BOOK HOLDER

Rollie B. Nawman, Oakland, Calif., assignor to Benner-Nawman, Inc., Walnut Creek, Calif.

Filed Sept. 18, 1972, Ser. No. 290,134
Int. Cl. B42d *17/00*
U.S. Cl. 281—46 **8 Claims**

A book container employs metal rods interleaved among the pages of a book or passed through the spine of a book to hold the book within hinged, semi-rigid covers which are spring-biased to a closed position. The container depends subjacently from a shelf and parallel to the edge of the shelf by means of a doubly-pivoting bracket. The bracket allows the

container to be revolved onto the shelf and rotated to be positioned for normal viewing of the book. The pivot shaft includes a transverse radial pin riding an annular cam, the



weight of the container when depending from the bracket causing the pin to traverse the cam surface and rotate the container and return it parallel to the shelf edge.

3,791,678

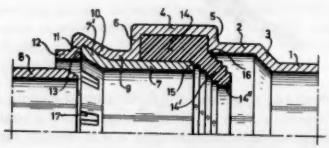
PIPE COUPLING

Warner Jan De Putter, Hardenberg, Netherlands, assignor to Industriele Onderneming Wavin NV, Zowolle, Netherlands

Filed Feb. 22, 1972, Ser. No. 227,825

Int. Cl. F16l *17/00*

U.S. Cl. 285—110 **3 Claims**



Pipe coupling comprising a pipe end inserted in a sleeve shaped coupling part, which consists of a stepped cylindrical widening of a pipe. The diameter of a first widening is larger than the outer diameter of the pipe end. The mouth of a second widening is partially narrowed and, in the second widening is situated a sealing ring of rubber, said sealing ring being provided with a lip. The sealing ring is retained by means of a thin walled retaining ring, which is preferably provided with notches for deformation.

3,791,679

PIPE FITTINGS

John Benjamin Glover, Stocksbridge, England, assignor to The Hepworth Iron Company Limited, Sheffield, England

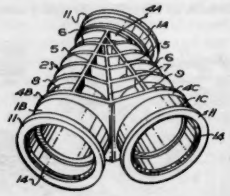
Filed Dec. 3, 1971, Ser. No. 204,518

Claims priority, application Great Britain, Dec. 18, 1970, 60315/70

Int. Cl. F16l *41/00*

U.S. Cl. 285—155 **10 Claims**

A pipe fitting, especially a pipe junction, is formed of resilient plastics material and has sockets integrally joined by tubular necks to a hollow body, which is stiffened by longitudinal ribs extending between collars adjacent the necks and circumferential ribs connecting the longitudinal ribs, so that the load-bearing capacity is comparable with that of pipes, especially clayware pipes, which it is used to connect, without use of excessive plastics material, and yet affording allowance for the usual departures of pipe-ends from true circularity and tolerances on nominal diameter, as well as accommodating



axial and/or angular misalignment over and above any between the pipes allowed for in the design of the fitting.

3,791,680

END FITTINGS FOR FLEXIBLE METALLIC CONDUITS

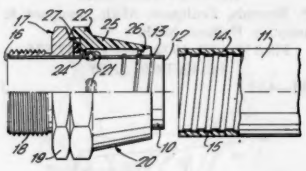
Ian Martin Cleare, Wycombe, England, assignor to Smiths Industries Limited, London, England

Filed June 28, 1972, Ser. No. 266,874

Claims priority, application Great Britain, July 2, 1971, 31059/71

Int. Cl. F16l *33/22*

U.S. Cl. 285—174 **3 Claims**



An end fitting for a flexible metallic conduit comprises a metal tube having an external thread at one end to enable the tube to be screwed into an end of the conduit, and first and second tubular members embracing the tube and disposed end to end along the tube. The tube has a plurality of projections spaced apart around the tube and disposed between the threaded end of the tube and the other end of the tube, and the second tubular member has a plurality of projections which interengage with the projections on the tube to enable the second tubular member to impart rotary movement to the tube. The second member has an inwardly directed flange which bears against the side of the projections on the tube remote from the threaded end thereof, and the first member is disposed between the flange and said other end of the tube, which end of the tube is turned outwardly captively to mount the first and second members on the tube. The first member is rotatable about the tube and has an external thread to facilitate mounting of the end fitting on a support.

3,791,681

DEVICES FOR ESTABLISHING SEALING CONNECTION BETWEEN THE ENDS OF TUBULAR MEMBERS OF SHEET METAL

Preben Moldow, Moelledamsvej 10, Birkeroed, Denmark

Filed Feb. 15, 1972, Ser. No. 226,620

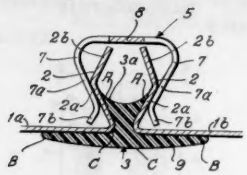
Claims priority, application Denmark, Feb. 17, 1971, 711/71; Jan. 17, 1972, 75/72

Int. Cl. F16l *21/00*

U.S. Cl. 285—233 **4 Claims**

A device for establishing sealing connection between the ends of tubular members, comprising outwardly bent end portions on the tubular members af resilient connecting strip having a substantially U-shaped cross section and forced over the

outwardly bent end portions of the tubular members to clamp the latter against a sealing member arranged therebetween, the cross section of the sealing member being composed of a first portion adapted to be clamped between the outwardly



bent end portions of the tubular members, a second portion constituting a flange extending into the adjoining tubular members to align the same, and a web connecting the first and second portion.

3,791,682

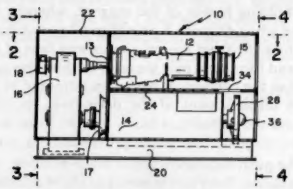
TURBINE DRIVEN ELECTRICAL GENERATOR

Robert W. Mitchell, Houston, Tex., assignor to Stewart & Stevenson Services, Inc., Houston, Tex.

Filed Aug. 23, 1972, Ser. No. 283,217

Int. Cl. F01d *15/10*

U.S. Cl. 290—2 **2 Claims**



A turbine driven electrical driven generator set having one or more turbines positioned above the generator to provide a power source at locations where there is a minimum available floor space. An acoustical enclosure enclosing the turbine and generator and having air filters for filtering the generator cooling air and the intake air to the turbine. An air fan driven from the generator for cooling the generator and the oil in the turbine and the reduction gearing between the turbine and the generator through an air/oil heat exchanger. The air fan cooling the turbine after shutdown.

3,791,683

SAFETY LOCK FOR ENCLOSURES

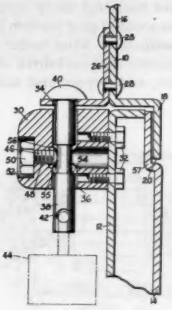
William L. Bright, 0605 S.W. Curry St., Portland, Oreg.

Filed Feb. 29, 1972, Ser. No. 230,223

Int. Cl. E05c *1/10, 7/02*

U.S. Cl. 292—32 **2 Claims**

A safety lock for enclosures having a first lock portion attached to the first of two members to be locked together. This lock portion includes a bolt rotatable for accomplishing a locking function. The bolt has a head of non-conventional shape. A second lock portion is attached to the other of the members to be locked together and is engageable by the bolt. The first lock portion includes a protective wall peripherally surrounding the bolt head and open at its outer end. The surrounding wall defines a socket which is at least as deep as the thickness of the bolt head to prevent side engagement of the bolt head and which is of greater diameter than the bolt head to permit removal of the bolt by a special wrench inserted through the open end of the protective wall. The second lock portion in one embodiment includes a pin having a radial notch intermediate its ends engageable by the bolt to provide a more positive lock. Also, in some embodiments, the pin projects beyond the first lock portion and receives a padlock or the end of the pin may project into a socket member to con-



ceal the end thereof. A further locking feature may employ a spring acting on one of the lock portions with a force great enough to prevent children from opening the lock even though other fastening means of the lock are released.

3,791,684

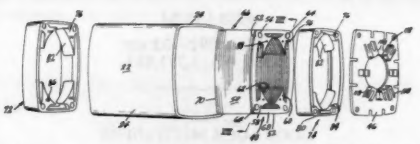
ELECTRIC STARTER MOTOR

Lyle J. Hamman, Eaton Rapids, Mich., assignor to Eaton Stamping Company, Eaton Rapids, Mich.

Filed Aug. 24, 1972, Ser. No. 283,559

Int. Cl. F02n *11/14*

U.S. Cl. 290—38 **8 Claims**



An electric starter motor for starting small internal combustion engines characterized by its high torque and compact size having a housing including four sides of convex configuration facilitating the winding of four field coils formed of mechanically interconnected and nested laminations defining a stack having annular synthetic insulators at the ends wherein the field wire coils are wrapped about both the poles defined by the laminations and aligned recessed insulators. The motor brushes are mounted upon a brush card, and the armature includes an extension extending from the housing upon which Bendix type starter apparatus is mounted. Four field coils and brushes are employed, and in the DC energized embodiment, two of the field coils are mounted in parallel and connected to one brush, while the other two field coils are connected in parallel with each other, and connected to an opposing brush. The coil connected brushes are shunted to equalize the voltage at the armature commutator.

3,791,685

STARTER PINION WITH MOLDED BASE AND DRIVE

Lyle J. Hamman, Eaton Rapids, Mich., assignor to Eaton Stamping Company, Eaton Rapids, Mich.

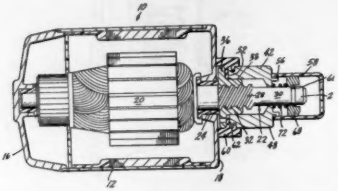
Filed Aug. 24, 1972, Ser. No. 283,560

Int. Cl. F02n *11/00*

U.S. Cl. 290—38 **15 Claims**

A starter pinion assembly for use with electric starters for internal combustion engines wherein a starter pinion gear is axially displaced upon a drive shaft during initial rotation of

the shaft to engage the pinion gear with an engine flywheel in order to crank the flywheel. The starter pinion includes a hub portion upon which the pinion gear teeth are mounted, the pinion gear teeth being capable of rotation relative to the hub portion, and resilient frictional drive means are interposed between the hub and toothed gear portion through which torsional forces are transmitted. Axial forces imposed upon the hub maintain an effective frictional drive connection with the toothed gear portion, and impact and shock forces are absorbed. A stop mounted upon the drive shaft limits axial movement of the starter pinion assembly, and a compression spring maintains the starter assembly in the "retracted" position when the drive shaft is not being rotated. The resilient drive means prevents binding of the pinion assembly with the stop. A resilient bumper mounted upon the starter assembly, formed of the friction material, absorbs axial movement of the starter assembly toward the noncranking position, brakes the pinion assembly against rotation and also functions as a dust seal.



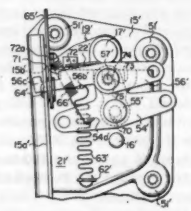
ERRATUM

For Class 292—32 see:
Patent No. 3,791,683

3,791,686
DOOR LOCK MECHANISM

Kiochiro Horozawa, Kariya, Japan, assignor to Aisin Seiki Company Limited, Kariya-shi, Japan

Continuation of Ser. No. 782,077, Dec. 9, 1968, abandoned.
This application Dec. 13, 1971, Ser. No. 207,240
Int. Cl. E05c 3/26
U.S. Cl. 292—216 6 Claims

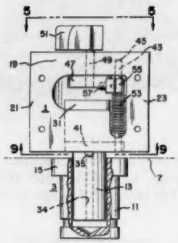


An automotive door lock mechanism, comprising a latch or fork member adapted for engagement with striker pin, a pivotable pawl adapted for engagement with said latch for performing the door lock a pivotable open plate adapted for controlling to establish or release the engagement between said latch and said pawl, and a locking plate pivotably mounted on the base of said lock mechanism, characterized by that said locking plate and said open plate are mounted pivotably to each other.

3,791,687
POP UP MAGNETIC DOOR STOP AND HOLDER

Helmuth M. Schroeder, 17908 Beardsley St., Castro Valley, Calif.

Filed June 19, 1972, Ser. No. 263,929
Int. Cl. E05c 19/16
U.S. Cl. 292—251.5 7 Claims

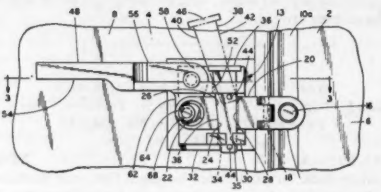


A cylindrical bar of magnetic material pops up from its installed position in a floor when a magnet, carried by a housing affixed to a door, reaches the position of installation of the bar, as the door is opened, such attraction of the bar to the magnet serving to stop and hold the door in its open position. A manually operable push member is capable of separating the cylindrical bar of magnetic material from the magnet, to weaken the holding power of the magnet, whereby the door may be closed when desired. A pair of small protuberances extending downwardly from the proximate end face of the magnet housing and forming a part thereof, enables this end of the housing to span the cylindrical bar when attracted to the magnet, whereby displacement of the door from its position is precluded until the cylindrical bar is pushed from its engagement with the magnet. One of the protuberances may extend lower than the push member when in down position, to always function as a stop to limit maximum opening of a door.

3,791,688
OPENING, CLOSING AND LOCKING DEVICE

John D. Bailey, Orland Park, Ill., assignor to Pullman Incorporated, Chicago, Ill.

Filed Oct. 6, 1972, Ser. No. 295,757
Int. Cl. E05c 19/08
U.S. Cl. 292—283 5 Claims



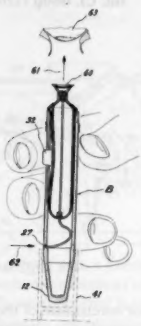
In a railroad car having sliding doors, a lock device including a hasp pivotally mounted on a first sliding door and a bell crank lever pivotally mounted on the second door with the lever pivotally carrying a wedge to wedgingly lock the hasp, lever and a keeper on the second door to keep the doors locked together, the bell crank lever having a drive arm releasably connecting with the hasp for moving the first door away from the second door when the locking wedge pin is removed from the door and the hasp in a freed position by a downward movement of the handle of the lever while at the same time freeing the lever held wedge.

3,791,689

CONTACT LENS HOLDER

Roger S. Boone, 721 Fincastle, Tazewell, and Frank Pyott, 601 Fairground Rd., Falls Church, both of Va.

Filed June 11, 1971, Ser. No. 152,292
Int. Cl. A61f 9/00
U.S. Cl. 294—1 CA 5 Claims



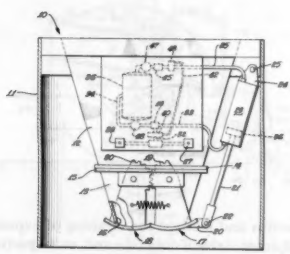
A device designed for holding and aligning corneal lenses during insertion and removal from the eye, where the lens can be held against a lens cup under partial vacuum created by a squeeze bulb, while a fiber-optical light conductor terminating inside the lens cup transmits a pencil of light for convenient alignment with the eye, the latter having an angled-off light receiving axis to eliminate undesirable background interference from the light source.

3,791,690

GATE OPERATING SYSTEM FOR CONCRETE BUCKETS

Leslie H. Garlinghouse, 1585 Sierra Madre Villa, Pasadena, Calif.

Filed Dec. 26, 1972, Ser. No. 318,508
Int. Cl. E21b 33/132
U.S. Cl. 294—71 4 Claims



A system for opening and closing the clamshell gates at the bottom of the hopper of a bucket for placing concrete makes use of a receiver tank for storing air under pressure and a pneumatic actuating cylinder. A main pressure line for air under pressure has one branch connected to the opening end of a pneumatic cylinder and another branch connected to the receiving tank. A pneumatic line from the tank is connected to the pneumatic cylinder at the closing end and a pilot valve in the last mentioned line is subject to control by a pilot pneumatic line fed from the main pressure line whereby to vent the closing end of the cylinder when the opening end is in operation.

3,791,691

BUS STRUCTURE WITH EXTENSIBLE FRONT PLATFORM

Keith W. Tantlinger, Coronado, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Mar. 15, 1972, Ser. No. 235,035
Int. Cl. B60j 5/02; B62d 31/02
U.S. Cl. 296—28 A 6 Claims

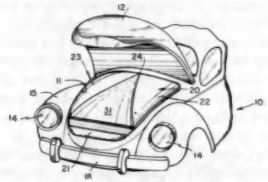
A transportation type vehicle herein described as a bus, has a door opening in its front end for loading and discharging passengers, and an extensible front platform, preferably with shock absorber mounting. A door for closing the door opening may be carried by the platform, so that extending the platform opens the door. Each side of the platform preferably comprises a drop ramp, which may be so controlled by the driver that extending the platform automatically lowers the ramp on a selected side of the bus, while at the same time a gate bars exit from the other side. Thus, the entire interior of the vehicle body is available for seating passengers, and passengers may be taken on or discharged from either selected side of the bus, as on a one way street.

3,791,692

AUTOMOBILE IMPACT ABSORPTION APPARATUS

Benjamin H. Piere, 19631 Delight St., Saugus, Calif.

Filed Apr. 20, 1972, Ser. No. 245,715
Int. Cl. B62d 25/00
U.S. Cl. 296—31 P 1 Claim

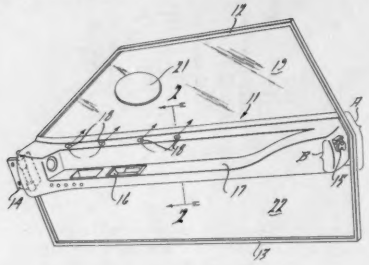


Apparatus for absorbing the energy of the impact of a collision of an automobile. The apparatus consists of an impact-energy absorbing material such as a plastic foam which may be molded in one piece for disposition in the trunk of the automobile. Preferably, the automobile is of the type having a rear engine and a front trunk into which the gasoline tank usually extends. The monolithic, molded foam may be cut into several sections, preferably three to facilitate insertion of the material into the trunk. Such a material has the advantages of reducing injuries due to collisions as well as reducing the cost of repair. It provides flotation, acoustic damping, and may be fire retardant to reduce even further the danger of fire if rupturing of the gas tank does occur in spite of the added impact protection. The plastic foam may be so arranged that it transmits the force of a front impact toward the side walls of the trunk which usually are stronger than the fire wall.

3,791,693
VEHICLE DOOR, IN PARTICULAR FOR MOTOR VEHICLES

Emund Hellriegel, Cologne, and Dieter Pfadenhauer, Pulheim, both of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 13, 1972, Ser. No. 234,228
Claims priority, application Germany, June 14, 1971, P 21 27 724.7
Int. Cl. B60j 5/04
U.S. Cl. 296—146 **14 Claims**

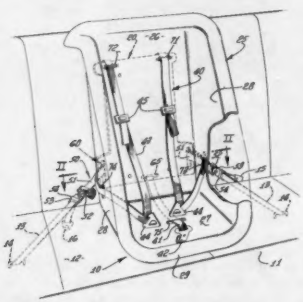


A vehicle door, in particular for motor vehicles, having a load-bearing cross-member linking the door hinges and the door lock, to which frames, guides and actuator devices for windows, as well as armrests, handles and actuating devices for the door lock, are attached. The cross-member is attached to flat sheet-metal or synthetic material components forming the internal and external panels of the door.

3,791,694
CHILD RESTRAINING SEAT ASSEMBLY

Verne L. Roberts, Southfield, and James H. McElhaney, Ann Arbor, both of Mich., assignors to American Safety Equipment Corporation, Encino, Calif.

Filed Feb. 18, 1972, Ser. No. 227,469
Int. Cl. A47d 1/10
U.S. Cl. 297—250 **3 Claims**

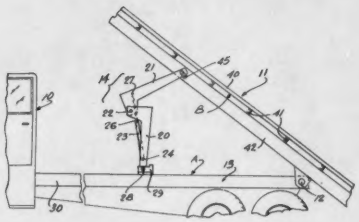


The seat assembly includes an inverted T shaped plate with two upper slots, opposite side slots and a lower slot; a molded plastic child seat rivited to the plate for placement on a vehicle seat; a crotch belt with an end buckle extending through the bottom slot to be mounted to the plate; a continuous right and left combination shoulder and lap strap extending through the remaining slots to be mounted to the plate for locating intermediate buckles thereon for joining to the buckle on the crotch strap so that the straps will restrain a child in the seat; and a pair of anchor belts extending through the side slots to be mounted to the plate for being joined to the seat belts of the vehicle whereby the restraining load of the straps is transferred via the plate to the anchor belts without being applied to the plastic seat.

3,791,695
VEHICLE HOIST MECHANISM

Stephen Peter Seniuk, 5 Chester St., Winnipeg, Manitoba, Canada

Filed Jan. 7, 1972, Ser. No. 216,044
Int. Cl. B60p 1/20
U.S. Cl. 298—22 J **9 Claims**

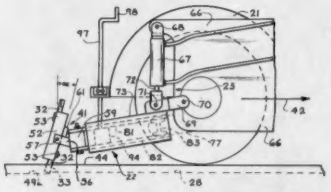


A dump truck hoist mechanism of the "scissors" type has L-shaped members, depending end portions of which project down below the plane of the upper surfaces of the vehicle chassis in order to achieve a combination of (*a*) a comparatively wide spacing between the axis about which the two members of the mechanism are interconnected and the location at which hydraulic cylinders act on the upper member to rotate it about such axis, with resulting good leverage, and (*b*) a lower than normal "mounting height" between the vehicle and dump box chassises. A lost motion mechanism is incorporated into the pivotal connection between the dump box chassis and the upper member to facilitate the linkage.

3,791,696
EXPANSION JOINT CLEANING APPARATUS AND METHOD

Marvin E. Riley, P.O. Box 246, Spokane, Wash.

Filed July 14, 1972, Ser. No. 271,942
Int. Cl. E01c 23/09
U.S. Cl. 299—10 **11 Claims**



An apparatus and method for cleaning of expansion joints between adjacent slabs of concrete and, more particularly, for removing joint sealant compositons from the expansion joints for periodic replacement thereof, are disclosed. The apparatus includes a vehicle having a tool carrying arm on which a plow-type cleaning tool is mounted. The cleaning tool has a cutting face formed from a material capable of cutting concrete and is dimensioned to create an overlap or interference fit with the side walls of the joint. The tool is mounted on the arm with the cutting face inclined toward the direction of advancement of the vehicle down the expansion joint during cleaning, and the cutting forces are applied downwardly and forwardly to effect cutting of the concrete while reducing spalling adjacent the joint. A pantograph-type linkage is employed with a tool having tapered side cutting edges to allow the tool to track or follow the expansion joint during plowing.

3,791,697

METHOD AND APPARATUS FOR FLAME JET CUTTING

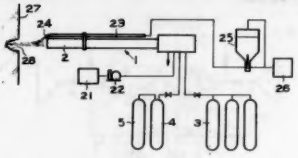
Zenjiro Hokao, Shimoyasumatu 50-80, Tokorozawa-chi, Saitama-ken, and Taiitsu Makajima, Nakato 2482, Musashimurayama-chi, Tokyo, both of Japan

Filed May 8, 1972, Ser. No. 251,183

Claims priority, application Japan, May 12, 1971, 46/32111; Oct. 6, 1971, 46/79018; Jan. 28, 1972, 47/10688

Int. Cl. E21c *21/00*

U.S. Cl. 299—14 7 Claims



A cutter proper is provided with a burner having at its tip a nozzle that injects a combustion flame of oxygen and kerosene at supersonic speed. Thermit material is supplied to the flame jet that is injected by burning the oxygen and kerosene at supersonic speed whereby the concrete or stone material and the like is burnt at such high temperatures where said material to be cut is melted. The cutting body can be cut by melting without relying on destruction of human work by injecting the flame jet toward the cutting body.

3,791,698

HYDRAULICALLY OPERATED APPARATUS FOR MECHANICAL SPLITTING OF ROCK AND THE LIKE

Helmut Darda, Im Tal, 7712 Blumberg/Baden, Germany

Filed Jan. 6, 1972, Ser. No. 215,791

Claims priority, application Germany, Jan. 13, 1971, P 21 01 353.6; July 30, 1971, P 21 38 071.2

Int. Cl. E21c *37/04*

U.S. Cl. 299—23 17 Claims

A wedge member has a front end and diverges in direction rearwardly therefrom. The wedge member is hydraulically displaceable in longitudinal direction and has a pair of opposite outer surfaces. A pair of spreading members which are fixed with respect to the longitudinal displacement of the wedge member, overlie the outer surfaces thereof in engagement with them so that they spread radially when the wedge member is displaced forwardly. Mating tongues and grooves are provided in the wedge member and the spreading members and matingly interengage when the wedge member is rearwardly displaced.

3,791,699

IMPACT APPARATUS FOR CUTTING GROOVES IN ROADS

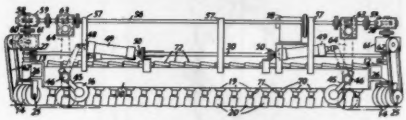
Ronald Albert William Clark, London, England, assignor to Klarcrete Limited, Redhill, Surrey, England

Filed May 24, 1972, Ser. No. 256,437

Claims priority, application Great Britain, May 28, 1971, 17868/71

Int. Cl. E01c *23/09*

U.S. Cl. 299—37 6 Claims



Apparatus for cutting parallel grooves in roads, particularly concrete roads, to improve the anti-skid properties of the road, comprises a plurality of pneumatic hammer units mounted in line on a frame supported on steerable road wheels, the hammer units being fitted with cutting tools engagable with the road and being operable to reciprocate the cutting tools so as to impart a series of impact blows to the road surface. The road wheels are drivably connected to a motor on the frame, and in operation the wheels are aligned in a direction such that the frame moves transversely or diagonally across the road with the hammer units spaced apart relative to the direction of travel, whereby the hammer units cut parallel grooves in the road surface. The hammer units are inclined at a small angle to the vertical so that the bases of the grooves are inclined downwards in the direction of the flow of traffic on the road, the downstream side of each groove having a sharply defined edge and the upstream edge merging into the uncut road surface between the grooves.

The frame is provided with retractable wheels drivably connected to the motor and pneumatic cylinders operable to force the retractable wheels downwards and lift the hammer units and road wheels above the road. In operation of the apparatus, the retractable wheels are parallel to the centre line of the road being cut so that after cutting one band of parallel grooves on the steerable wheels the frame can be moved forwards on the retractable wheels to a position suitable for cutting the next band of grooves without altering the steering angle of the road wheels. The steering mechanism of the road wheels may be continuously adjusted during travel of the frame to cut grooves along a curved path, particularly a curved path having a radial centre on or adjacent the longitudinal centre line of the road upstream of the grooves, which curved grooves have a centering effect on the wheels of vehicles.

3,791,700

VEHICLE WHEEL TRIM

Richard R. Golze, Bloomfield Hills, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

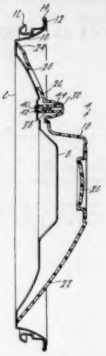
Filed Oct. 28, 1971, Ser. No. 193,386

Int. Cl. B60b *7/04*

U.S. Cl. 301—37 CM 2 Claims

A wheel trim for a motor vehicle including a wheel cover formed from a first material and attachment means for securing the wheel cover to a vehicle wheel. A wheel trim ornament is formed from a second material, disposed over at least a por-

tion of the wheel cover and has extending therefrom in the direction of the wheel cover at least one flexible projection.



Fastener means interconnect the wheel cover and the flexible projection.

3,791,701

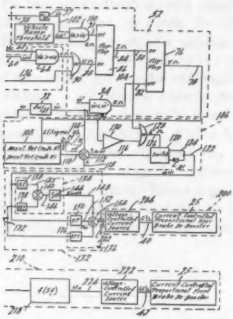
SKID CONTROL SYSTEM

Hugh E. Riordan, Ann Arbor, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Division of Ser. No. 60,273, Aug. 3, 1970, Pat. No. 3,687,504. This application July 7, 1972, Ser. No. 269,509

Int. Cl. B60t *8/10*

U.S. Cl. 303—21 BE **8 Claims**



A braking system including a skid control system, in which the brakes are actuated from a source of hydraulic power with the magnitude of pressure to the brakes being varied generally as a function of the input force from the vehicle operator and; during controlled operation, as a function of the magnitude of an error signal indicative of an incipient skid or excessive slip condition.

3,791,702

BRAKE-FORCE CONTROL SYSTEM FOR VEHICLES, ESPECIALLY MOTOR VEHICLES

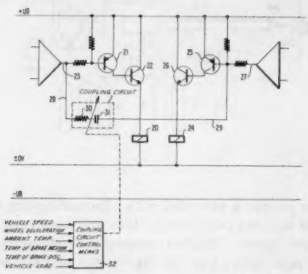
Manfred H. Burckhardt, Waiblingen; Hellmut Krohn, Esslingen; Horst Grossner, Gerardstetten, and Hans-Jorg Florus, Coppingen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Aug. 4, 1971, Ser. No. 168,909

Claims priority, application Germany, Aug. 4, 1970, P 20 38 599.3

Int. Cl. B60t *8/08*

U.S. Cl. 303—21 BE **21 Claims**



A brake force control system for vehicles, especially for motor vehicles in which the brake medium pressure acting on the brakes is controlled as a function of the rotary condition of the wheel by magnetically controlled inlet and outlet valves in the manner of a three point control; during each control of an inlet valve a signal causing a short defined opening of the outlet valve is simultaneously fed to the associated outlet valve by way of a coupling apparatus, preferably consisting of a circuit including a resistor and reactive impedance whose values may be varied as a function of certain characteristics of the brake force control system.

3,791,703

JOURNAL SUPPORT BEARINGS FOR ROTATING SHAFTS

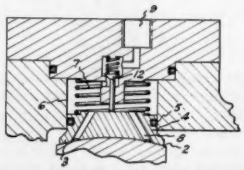
Richard Joseph Ifield, New South Wales, Australia, assignor to Ifield Laboratories Pty. Limited, New South Wales, Australia

Filed Nov. 23, 1971, Ser. No. 201,372

Claims priority, application Australia, Nov. 30, 1970, 3338/70

Int. Cl. F16c *7/04, 17/06*

U.S. Cl. 308—9 **5 Claims**

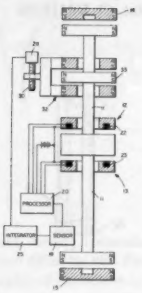


Journal support bearings for rotating shafts which comprise at least one hydro-statically balanced slipper positioned within a stationary housing. Each slipper has a hollow spherical surface which is adapted to bear on a part spherical surface formed on a shaft about its axis of rotation. Each slipper is either cut out at its center or has grooves in its surface to define a narrow sealing land around the periphery of the surface.

3,791,704
TRIMMING APPARATUS FOR MAGNETIC SUSPENSION SYSTEMS

Lloyd J. Perper, Tucson, Ariz., assignor to Cambridge Thermionic Corporation, Cambridge, Mass.

Filed Aug. 6, 1971, Ser. No. 169,665
Int. Cl. F16c *39/06*
U.S. Cl. 308—10 7 Claims

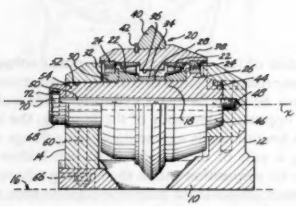


Apparatus is disclosed for trimming magnetic bearings and particularly for trimming magnetic bearings which employ two independently cooperating systems comprising a permanent magnet system and an electromagnet system. Adjustable permanent magnet means are disclosed for maintaining a suspended object in an equilibrium position which is invariant with applied force in at least one dimension. According to one embodiment the trimming is accomplished by mechanically moving adjustable permanent magnets. According to another embodiment of the invention the trimming is accomplished by varying the field of adjustable permanent magnets using at least one magnetizing winding.

3,791,705
MOUNTING STRUCTURE FOR A ROCK CUTTER WHEEL

Gordon G. Schimel, Kent, Wash., assignor to The Robbins Company, Seattle, Wash.

Filed Mar. 31, 1972, Ser. No. 240,034
Int. Cl. F16c *35/08*
U.S. Cl. 308—15 16 Claims

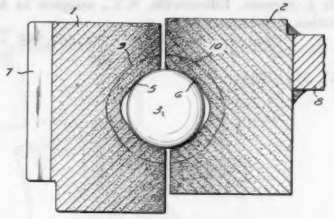


The cutter wheel is mounted for rotation about an elongated support shaft. This subassembly is moved endwise towards a first end standard until a mounting pin on either the shaft or the end standard engages a mounting pin socket in the other. A second mounting standard is moved towards the second end of the shaft until a second mounting pin on either the shaft or the second end standard is engageable with a mounting socket formed in the other. The second end standard is bolted or otherwise detachably mounted to its support.

3,791,706
FORGED RING STRUCTURE OF MULTIPLE CAST METALS

John C. Dobson, Bay Village, Ohio, assignor to Formmet Corporation, Avon, Ohio

Division of Ser. No. 151,264, June 9, 1971, Pat. No. 3,714,694.
This application Oct. 4, 1972, Ser. No. 294,829
Int. Cl. F16c *33/58*
U.S. Cl. 308—216 6 Claims

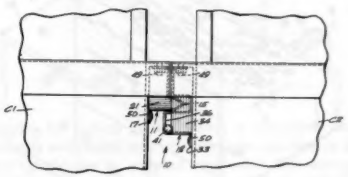


Disclosed are antifriction bearings, annular ring blanks for forming races of the bearings, and a process of making the annular blanks. The process involves centrifugally casting metals having different chemical compositions, such as steel having different amounts of carbon or other alloying elements, to form a tubular casting having at one periphery metal that has a different chemical or metallurgical composition and hardenability than the metal at the other periphery; annular rings are cut from this tubular casting, and these rings are hot worked by working including roll forging, under conditions that beneficially modify the structure of the metal. The resulting race may be machined into annular bearing races by the usual procedures to form bearing races. These races are hardened in a known manner and by known means, to provide hard metal where the rolling antifriction elements, such as balls, contact the metal, while the metal at the opposite side of the race is substantially more ductile and tough, so that it may be machined to provide gear teeth, or may be machined or welded for other purposes as to provide fastening means for the bearing race.

3,791,707
INTERLOCKING DEVICE FOR PORTABLE FOOD SERVICE CABINETS AND THE LIKE

Bruce F. House, Coral Gables, Fla., assignor to Shelley Manufacturing Company, Miami, Fla.

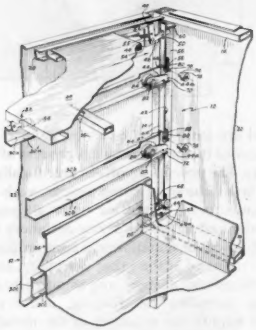
Filed May 11, 1972, Ser. No. 252,428
Int. Cl. F16b *12/06*, *12/32*
U.S. Cl. 312—111 7 Claims



An interconnecting and locking device for joining portable food service cabinets and the like in side-by-side relation while at the same time adjusting them to be in substantial vertical and horizontal alignment simply by pushing the cabinets together. The device comprises elongated male and female connector members adapted to be secured horizontally along opposed upper edge portions of the cabinets to be joined, the female connector member having an elongated recess along its length and the male connector member having an elon-

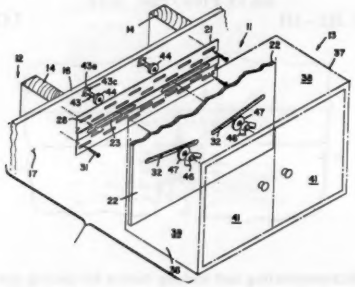
gated nose member along its length, both of which are convergently beveled to the outside to serve as horizontal and vertical locating means upon interconnection of the device. Releasable latch means is provided for locking the device in interconnected relation while at the same time providing for manual release for separating the cabinets.

3,791,708
DRAWER LOCKING SYSTEM
Dennis J. Signore, Ellicottville, N.Y., assignor to AVM Corporation, Jamestown, N.Y.
Filed June 29, 1972, Ser. No. 267,385
Int. Cl. E05c 7/06
U.S. Cl. 312—221 **7 Claims**



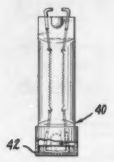
A writing slide controlled lock mechanism for simultaneously locking drawers of a pedestal type desk. The mechanism features latch members carried by the drawers and a locking bar movable by closure of the writing slide to a locking position for effecting locking of the drawers which are in or are subsequently moved into closed position.

3,791,709
BRACKET CONSTRUCTION FOR WALL MOUNTING OF CABINETS
James Waverley Cross, 42 Altos Oaks Dr., Los Altos, Calif.
Filed Sept. 8, 1970, Ser. No. 70,242
Int. Cl. A47b 67/02; A47f 5/08; A47h 1/10
U.S. Cl. 312—245 **8 Claims**



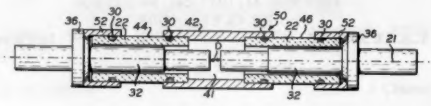
Bracket construction for wall mounting of cabinets having a relatively rigid member adapted to be secured to a wall and an additional rigid member. Each of the members has a pair of slots formed therein with the slots on one of the members being inclined at an angle with respect to the slots in the other of said members. Releasable securing means extends through the slots in the first-named and additional members for removably securing the additional member to the first-named member whereby said slots permit adjustment of the additional member with respect to the first-named member.

3,791,710
METHOD FOR PRODUCING A MULTIPLE FILAMENTED CARTRIDGE LAMP
Lorin W. Curtis, Sun City, Calif., assignor to Wagner Electric Corporation, Newark, N.J.
Filed Mar. 24, 1972, Ser. No. 237,847
Int. Cl. H01j 9/00
U.S. Cl. 316—17 **6 Claims**



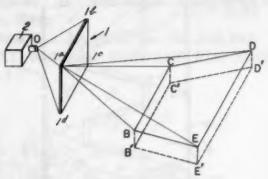
A method for producing multiple filamented cartridge lamps is disclosed. The multiple filaments are connected together on the external ends of a cartridge lamp by linking members and then the ends of the lamp are press sealed. Thereafter, a linking member is separated externally on at least one end to form separate terminals for each filament whereby each filament can have a separate source of energy.

3,791,711
METHOD OF FABRICATING A THREE-TERMINAL VOLTAGE SURGE ARRESTER
Gaylord D. Jonassen, Smithtown, N.Y., assignor to Telecommunications Industries, Inc., Copaigue, N.Y.
Filed Oct. 13, 1972, Ser. No. 297,412
Int. Cl. H01j 9/38
U.S. Cl. 316—20 **4 Claims**



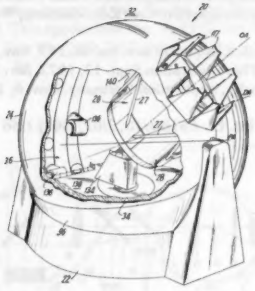
A method of fabricating a three-terminal voltage surge arrestor comprising the steps of forming an electrically conductive hollow housing having a cylindrical side wall extending between opposed open ends of the housing, the side wall including a longitudinally extending welding flange at each end; disposing a pair of electrically insulative hollow cylindrical members for disposition within the housing adjacent opposing ends thereof; disposing a pair of electrode rods through the ends of said housing, including a means thereon for engaging its associated welding flange as the rod is inserted into the housing through an end thereof to concentricize the rod in the housing; securing one electrode rod to an end of the housing by welding to said welding flange; withdrawing air from the interior of the housing through the other end of the housing; injecting a noble gas into the interior of the housing through said other end of the housing; securing the other electrode rod to said other end of the housing by welding; and isolating a segment of the housing side wall from both electrode rods.

3,791,712
PROJECTION SCREEN
Kiyoshi Miyagi, Yokohama, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Osaka, Japan
Filed Apr. 18, 1972, Ser. No. 245,158
Claims priority, application Japan, Apr. 20, 1971, 46-25889
Int. Cl. G03b 21/60
U.S. Cl. 350—128 4 Claims



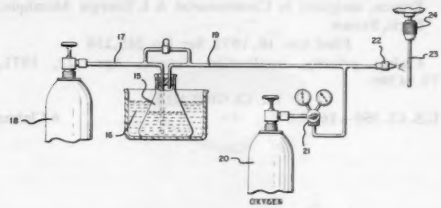
A projection screen having lenticular lenses in which the directions of refraction differ by 90°. Each lens is made in such a manner that the angles of refraction are varied from the central portion of the lens to its end portions so that an incident ray is uniformly dispersed throughout the service area. The surfaces of the lenticular lenses are finished to prevent a virtual image.

3,791,713
REFLECTING TELESCOPE SYSTEM
Anthony Mackay, Costa Brava 17, 4B, Madrid 20, Spain
Filed Sept. 21, 1971, Ser. No. 182,350
Int. Cl. G02b 23/16
U.S. Cl. 350—83 3 Claims



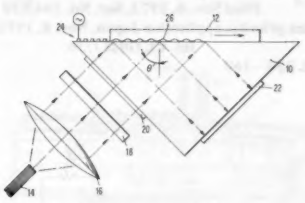
A dynamic reflecting telescope system having a support and a hollow spherical housing rotatably mounted thereon. A telescope is fixedly mounted within the hollow spherical housing for rotational movement therewith. The telescope is thermally insulated from the interior of the hollow spherical housing thereby defining two distinct volumes, the volume within the telescope being maintained at essentially the same temperature as the surrounding atmosphere, whereby definition is improved by eliminating variations in the index of refraction within the telescope. Monitoring means adjusts the tangential and radial position of the individual primary mirror portions to compensate for atmospheric turbulence.

3,791,714
METHOD OF PRODUCING GLASS FOR OPTICAL WAVEGUIDES
Robert Distler Maurer, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Mar. 30, 1972, Ser. No. 239,589
Int. Cl. G02b 5/14; C03c 25/2, 15/00
U.S. Cl. 350—96 WG 12 Claims



Deuterium is used instead of hydrogen in a process for producing glass having low hydroxyl ion content. In a flame hydrolysis process deuterium gas, or a deuterium compound gas, is passed through a liquid containing a silicon compound such as silicon tetrachloride. The resulting vapor is burned to deposit a film of silicon dioxide on a rotating mandrel. Glass produced in this manner is particularly suitable for use as optical waveguides. The hydroxyl ion normally present in glass produced in the presence of hydrogen is replaced by the deuterium containing ion OD^-. Absorption peaks normally caused by the presence of the hydroxyl ions are shifted to longer wavelengths at which the absorptions are not troublesome when the waveguide is used to transmit light in the band of approximately 7,000A.

3,791,715
SYSTEM FOR COUPLING LIGHT FROM A FIBER OPTIC WAVEGUIDE INTO A THIN FILM WAVEGUIDE
Eric G. Lean, Mahopac, and Keith S. Pennington, Somers, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 11, 1972, Ser. No. 314,204
Int. Cl. G02b 5/14
U.S. Cl. 350—96 WG 6 Claims



A coupler for optical guided waves is described which is electronically switchable and wherein light traveling in a fiber optic waveguide can be coupled into a thin film waveguide. The coupler consists of a substrate which in one embodiment is triangular in shape, with a thin film waveguide and an acoustic transducer on one surface thereof. The transducer is designed to produce an acoustic wave across the surface of the substrate and beneath the thin film waveguide. The output light from the optical fiber is introduced via a lens into a Fabry-Perot cavity formed by placing two high reflectivity mirrors located on the other two sides of the substrate. The light from the optical fiber is reflected back and forth in the cavity by being reflected from the surface on which the thin film is located. When the acoustic transducer is operated at

the proper frequency, the light in the cavity is coupled into the thin film waveguide. Another embodiment is also shown wherein the fiber optic is connected directly into the substrate which is not triangular in shape.

3,791,716

DEVICE FOR DEFLECTING A LIGHT BEAM

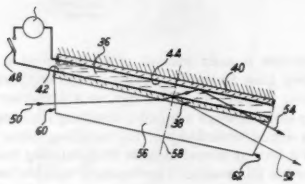
Joseph Borel, Echirolles; Jean-Claude Deutsch, Grenoble; Guy Labrunie, Seyssinet, and Jacques Robert, Grenoble, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Apr. 18, 1972, Ser. No. 245,238

Claims priority, application France, Apr. 22, 1971, 71.14399

Int. Cl. G02f *1/16*

U.S. Cl. 350—160 LC **6 Claims**



The device comprises at least one liquid-crystal cell placed on the path of the beam and constituted by a film of liquid crystals interposed between two walls provided with electrodes between which a potential difference can be applied by suitable means. The incidence of the light beam is oblique with respect to the first wall-liquid crystal interface which is encountered. Use is made of liquid crystals for which the direction of propagation of the light beam is dependent on the potential difference applied between the electrodes.

3,791,717

LIGHT MODULATION APPARATUS

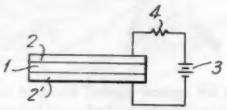
Masanori Honda, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 6, 1972, Ser. No. 304,039

Claims priority, application Japan, Nov. 8, 1971, 46-88821

Int. Cl. G02f *1/36*

U.S. Cl. 350—160 **11 Claims**



Light modulation apparatus or a light repeater directly modulates a light beam into light and comprises a light modulation element having a photoconductive effect and the Franz-Keldysh effect. When intensity modulated light is emitted to the light modulation element, the applied electric field in the light modulation element is controlled. Non-modulated light applied to the light modulation element undergoes intensity modulation due to the Franz-Keldysh effect related to the variations of the applied electric field.

3,791,718

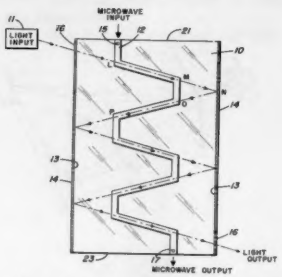
WIDEBAND TRAVELING-WAVE MICROSTRIP MEANDER-LINE LIGHT MODULATOR

Kungta K. Chow, Sunnyvale, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 21, 1972, Ser. No. 308,644

Int. Cl. G02f *1/26*

U.S. Cl. 350—160 R **6 Claims**



A traveling-wave electro-optical light modulator comprises an electro-optical crystal wafer with electrodes on the top and bottom surfaces and a high reflectivity coating covering the side surfaces except for two predetermined areas. A beam of light enters the crystal through one of these areas, is reflected a number of times between the two side surfaces, and leaves the crystal through the other area. The top electrode is in the form of a strip. The light beam passes under the strip once during each reflection. The strip lies on the crystal surface in such a manner that the traveling-wave impressed on the electrodes is traveling in the same direction as the light beam when modulation occurs.

3,791,719

METHOD OF AND DEVICE FOR DETERMINING THE STATE OF REFRACTION OF A HUMAN EYE

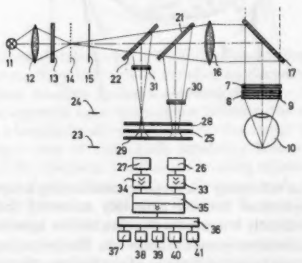
Bernd J. L. Kratzer, Huttlingen, and Heinz Ulffers, Aalen, both of Germany, assignors to Carl Zeiss-Sliftung, Wuerttemberg, Germany

Continuation-in-part of Ser. No. 86,217, Nov. 2, 1970, abandoned. This application Sept. 13, 1972, Ser. No. 288,689

Claims priority, application Germany, Nov. 6, 1969, P 19 55 859.9

Int. Cl. A61b *3/10, 3/02*; G01j *1/36*

U.S. Cl. 351—11 **9 Claims**



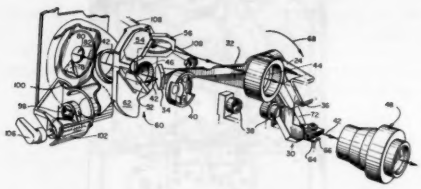
For determining the state of refraction of a human eye there is first effected automatically a coarse balancing operation and subsequently a fine balancing operation is performed manually with the same apparatus. Said apparatus may be a phoropter or another known device for determining the state of refraction of a human eye. A refractometer attachment is

connected to said device and effects automatically the objective coarse balancing operation. The fine balancing operation of said device is performed manually after switching off said attachment.

3,791,720
OPHTHALMOMETER HAVING ALTERNATIVE VIEWING AND MEASURING SYSTEMS AND INCLUDING AN IMPROVED ILLUMINATION SYSTEM

Terence Walker, and Joseph C. Dianetti, both of East Aurora, N.Y., assignors to American Optical Corporation, Southbridge, Mass.

Filed Nov. 29, 1972, Ser. No. 310,504
Int. Cl. A61b *3/10*; **G01b** *9/00*; **F21r** *33/00*
U.S. Cl. 351—13 **10 Claims**

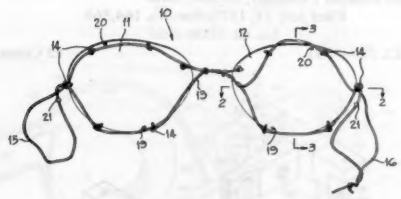


Ophthalmometer including a measuring circuit for measurement of the curvature of the cornea and contact lens curvatures with a built-in viewing circuit which is activated by the movement of a lever to allow visible inspection of the cornea and contact lenses. An interference ultraviolet filter in communication with a single light source permits the cornea to be viewed under ultraviolet light as well as ordinary visible light.

3,791,721
GOGGLES

James L. Helfrich, 4232 Hartel St., Philadelphia, Pa.

Continuation-in-part of Ser. No. 95,740, Dec. 7, 1970, abandoned. This application Oct. 4, 1972, Ser. No. 295,088
Int. Cl. G02c *7/10*, *3/00*; **A61f** *9/02*
U.S. Cl. 351—44 **5 Claims**



Compact eye goggles for protection against laser and other high intensity light radiation or energy and having a pair of eye cups which are worn without discomfort over the respective eye balls, lids and lashes of the eyes of the wearer. Should the user wear spectacles, the goggles are worn under the glasses. The cups introduce no distortion of the optical path and can be worn by people with various eye corrections. The cups are each partially hemispherical with rounded corners to snugly fit the user's face without interfering with vision, forward or peripheral.

3,791,722
LENSES

Carl S. Ahlberg, and John W. Drongeson, both of Minneapolis, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 12, 1972, Ser. No. 217,151
Int. Cl. G02c *7/16*; **A61f** *9/06*
U.S. Cl. 351—45 **9 Claims**

Lenses are provided having a central sight zone embracing the field of view and at least an upper shading or shielding zone of lower transmittance arcing around the clear central zone so as to provide shading from above and the sides. A further amount of shading may be provided below the clear portion. Shading and lower transmittance are most advantageously provided by louvered film. The lenses are particularly adapted for skiing goggles.

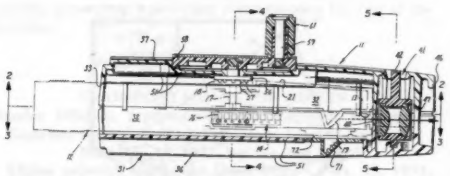
ERRATUM

For Class 352—123 see:
Patent No. 3,791,622

3,791,723
MOTION PICTURE APPARATUS

Tosio Komazaki, Tokyo, Japan, assignor to Action Films, Inc., Mountain View, Calif.

Filed Nov. 1, 1972, Ser. No. 302,742
Int. Cl. G03b *21/00*
U.S. Cl. 352—72 **6 Claims**



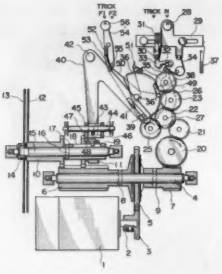
Motion picture apparatus for use with a removable cartridge having a housing with a cavity formed therein for receiving the cartridge. The housing is provided with a side wall which has a drive member carried thereby. The side wall is formed to permit the portion of the side wall carrying the drive member to be deformed outwardly so as to permit a driving member carried by the cartridge to move over the drive member and to engage the drive member so that the drive member drives a driven member as the drive member is rotated.

3,791,724

OVERLAP CONTROL DEVICE FOR A MOTION PICTURE CAMERA

Hiroshi Hirata, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 66,411, Aug. 24, 1970, abandoned. This application Oct. 16, 1972, Ser. No. 297,651
Claims priority, application Japan, Aug. 25, 1969, 44-66462
Int. Cl. G03b *21/36*
U.S. Cl. 352—91 **3 Claims**



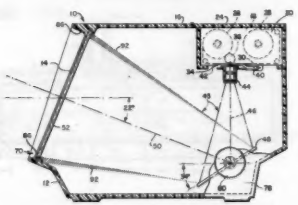
First and second circuits for energizing a motor in a normal and a reverse direction to drive film for controlling fade-in and fade-out photography are actuated by a change-over switch which is set by a first manual member at either a normal or fade-in, fade-out photographic positions which respectively select either said first or second energizing circuit. The second energizing circuit includes a switch contact which is closed or opened in accordance with the position of a second manual settable member. The shutter blade mechanism includes a control member for decreasing and increasing the opening thereof. A transmission mechanism is controlled in accordance with the position of the first manually settable member to change the direction of film winding.

3,791,725

PROJECTION SYSTEM EMPLOYING ADJUSTABLE MIRROR FOR IMAGE FRAMING

Richard W. Young, Wellesley Hills, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 6, 1971, Ser. No. 204,869
Int. Cl. G03b *21/00, 21/46*
U.S. Cl. 352—129 **1 Claim**



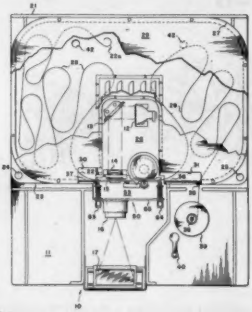
A photographic projection system employing an oversize projection aperture and adjustable mirror configured for displacement of the projection path relative to the projection screen so as to frame the projected image within the screen border and thereby transmit only the recorded image of the film to an observer. In a preferred embodiment, the system is a rear projection viewer having a projection lens assembly configured for projecting an image of a film section to an adjustably mounted mirror element and from the latter to the rear of a transparent, front-viewing screen. The projection lens assembly is adapted to project an image of a film section which exceeds the area of the recorded image-frame, and the viewing screen includes an opaque border element which conforms to the projected size of the image-frame such that displacement of the mirror element adjusts the projection path relative to the screen and frames the projected image within the screen border.

3,791,726

LOW INTERTIA FILM DRIVE AND CASSETTE

John W. Miller, Smyrna, Ga., assignor to Lockheed Aircraft Corporation, Los Angeles, Calif.

Filed Sept. 17, 1971, Ser. No. 181,295
Int. Cl. G03b *1/48, 23/04*
U.S. Cl. 352—166 **9 Claims**



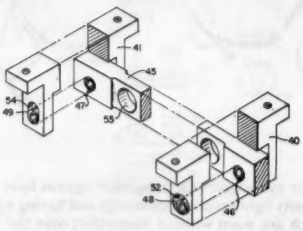
Storage and transport apparatus for a web such as photographic film and the like. The film, which is stored in randomly formed loops within the cassette, is withdrawn from the cassette, passed along a film gate including a projection gate by a drive wheel and pinch rollers which contact the film along its edges, and then is returned to the cassette. The design of the film channel, along with the absence of conventional film storage reels, provides a film transport system having low inertia and resulting in rapid frame access time coupled with precision frame positioning.

3,791,727

MICROFORM READER PROJECTION LENS TRACKING MECHANISM

Robert L. Kleekamp, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed July 21, 1971, Ser. No. 164,569
Int. Cl. G03b *3/00*
U.S. Cl. 353—101 **12 Claims**



A mechanism for permitting a projection lens assembly in a microform reader to freely float during tracking operation wherein constant focus is maintained throughout the travel of the assembly across the cover plate of a microform carrier. A projection lens mounting member is supported by means of a

connection adjacent the projection lens and a connection distal from the lens, the connections being of the lost-motion type to provide for such free floating of the lens assembly.

3,791,728

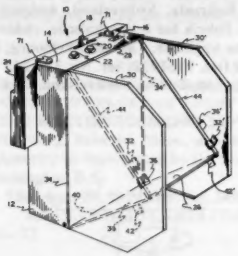
PORTABLE MICROFILM VIEWER

Morton Kaye, Stamford, Conn., and Marvin I. Radlauer, 2 Mistletoe Dr., Matawan, Madison Township, Middlesex, N.J., assignors to Marvin I. Radlauer, Matawan, N.J.

Filed Nov. 1, 1971, Ser. No. 194,724

Int. Cl. G03b *21/11, 21/30*

U.S. Cl. 353—26 **1 Claim**



A portable microfilm viewer is described, which is of compact structure. The viewer includes a control for advance of the microfilm with a lock-out feature whereby single frame advance is deactivated when continuous rapid film advance is selected. The microfilm viewer is adapted to stand upright on a flat surface, with a fold-out viewing screen supported in reading position by side-located shades. The shades fold protectively over the viewing screen when it is not in use, and provide shading against ambient light interference when the screen is in use.

3,791,729

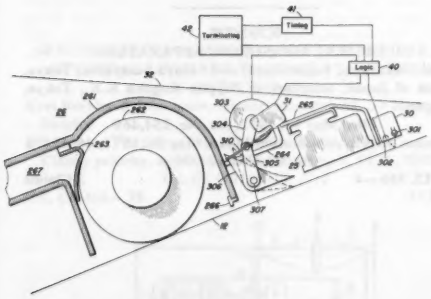
APPARATUS FOR MONITORING A SHEET TRANSPORT MECHANISM

Edward L. Steiner, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed July 11, 1972, Ser. No. 270,648

Int. Cl. G03g *15/22*

U.S. Cl. 355—3 R **6 Claims**



Apparatus for monitoring a sheet transport mechanism included in an electrostatic reproduction machine is disclosed in accordance with the teachings of the present invention. The electrostatic reproduction machine includes a support surface adapted to support a developed image of a character pattern, which developed image is transferred to an image receiving medium that is placed in contact with the support surface at a transfer station. Subsequent to the transfer of the developed image to the image receiving medium, the image receiving medium is removed from the support surface and transported to further operating stations. Detecting means in operable communication with the support surface is adapted to detect the presence of an image receiving medium in contact with said support surface, thereby indicating a failure of said image receiving medium to be removed. Means responsive to the detected presence of the image receiving medium serves to regulate the further operation of the electrostatic reproduction machine accordingly.

3,791,730

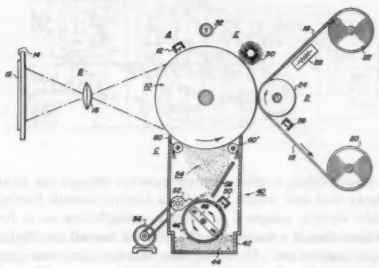
APPARATUS FOR DEVELOPING ELECTROSTATIC LATENT IMAGES

William A. Sullivan, Jr., Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 105,887, Jan. 12, 1971, Pat. No. 3,707,390. This application Sept. 5, 1972, Ser. No. 285,986

Int. Cl. G03g *15/08*

U.S. Cl. 355—3 DD **1 Claim**



A method and apparatus are provided for the development of electrostatic latent images formed on a support member. Magnetic toner particles are magnetically drawn over a non-magnetic surface, while on said surface a charge is applied to the toner particles which is opposite in polarity to that of the electrostatic latent image. A stream of gaseous material is directed against the charged toner particles carried on the non-magnetic surface to form a suspension of said particles in said gaseous material. This suspension, or powder cloud, is contacted with said electrostatic latent image to thereby develop said image with said toner particles. Also provided are toner collecting magnetic rollers which act as a seal by removing the residual toner particles from the suspension and thereby prevent the same from contaminating the rest of the machine.

3,791,731

TRANSPORT MEANS FOR SHEETS

Nandor Mihalik, Walton-on-Thames, England, assignor to Gestetner Copiers Limited, Tottenham, London, England

Filed Nov. 15, 1972, Ser. No. 306,872

Claims priority, application Great Britain, Nov. 18, 1971, 53,628/71

Int. Cl. G03g *15/00*

U.S. Cl. 355—3 R **7 Claims**

A transport roller for forwarding sheets bearing unfused electrostatographic images in copying apparatus comprises a

core with a coiled spring wound therearound, the axis of the coils surrounding the core. When the roller is used a minimal distortion or smearing of the powder images occurs.

3,791,732

ELECTROSTATIC COPIER

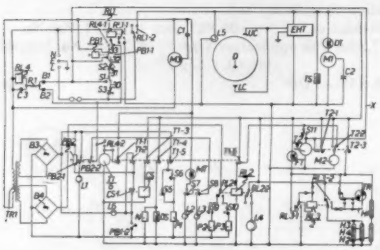
Nandor Mihalik, Walton-on-Thames; Andrew Anthony Moss, Hoddesdon, and John Charles Henry Prince, London, all of England, assignors to Gestetner Copiers Limited, Tottenham, London, England

Filed Nov. 15, 1972, Ser. No. 306,871

Claims priority, application Great Britain, Nov. 17, 1971, 53,460/71

Int. Cl. G03g *15/22*

U.S. Cl. 355—14 **18 Claims**



An electrostatic copier wherein powder images are heat set in a fuser unit and which includes a control circuit having an override device adapted to ensure completion of a fusing operation even if a main on/off switch is turned to off during such an operation. The override device can also ensure completion of a fusing operation in the event that safety devices are actuated during such an operation. This ensures completion of a fusing operation so that paper is not left in the fuser unit where it might ignite next time the copier was used. The copier additionally includes a rapid heating fuser unit and a timer motor to control copying operations.

3,791,733

PHOTOGRAPHIC DEVICE FOR ACHIEVING A DOMINANT COLOR EFFECT

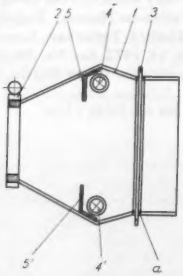
Stefan Horvath, and Aurel Miheles, both of Bucharest, Romania, assignors to Studioul Cinematographic Bucuresti, Bucahrest, Romania

Continuation-in-part of Ser. No. 850,071, Aug. 19, 1969, abandoned. This application Jan. 17, 1972, Ser. No. 218,265

Claims priority, application Romania, July 12, 1966, 51853

Int. Cl. G03b *27/70*

U.S. Cl. 355—39 **3 Claims**



A device to be used in photography for achieving a dominant color effect. Thus the device can be attached to the objective of any camera. It has a tubular enclosure open at both ends and is carrying at one end a fastener for releasably fastening the enclosure to an objective. Adjacent its other end the enclosure has a means for supporting a special color filter. Between the color filter and the objective is an illuminating structure for illuminating the color filter so as to achieve the dominant color effect. Between the illuminating structure and the objective is a shielding structure to prevent the light from the light source from travelling back to the objective, so that in this way the light is primarily directed toward the filter.

3,791,734

MICROFILM CAMERA AND LIGHT SOURCE THEREFOR

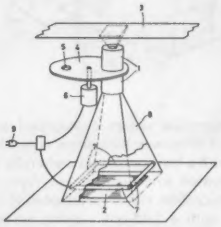
Hansjurg Mey, Kehrsatz, Switzerland, assignor to Walter Leemann A.G. Fabrik fur fototechnische, elektronische und feinmechanische Apparate, Canton of Fribourg, Switzerland

Filed Dec. 11, 1972, Ser. No. 314,252

Claims priority, application Switzerland, Oct. 13, 1972, 14974/72

Int. Cl. G03b *27/54, 27/76*

U.S. Cl. 355—67 **9 Claims**



A microfilm type camera utilized with an illumination device for impressing an image on film having a light source powered by an alternating current power supply for illuminating the image to be exposed to the sensitive film, an adjustable electrically powered shutter device for selectively admitting light from the image to the film, and an electrical drive connected to the shutter device for operating the same in a way that the adjustable exposure time for each point of the light sensitive film zone to be exposed is equal to half the duration of a period of the alternating current power supply source powering the light source or is an integer multiple thereof in order to provide an even light exposure distribution over the total image to be exposed on the film.

3,791,735

DIGITAL MEASURING APPARATUS

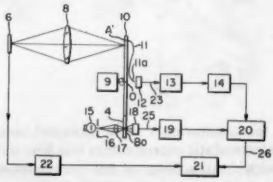
Kiwao Nakazawa, Sagamihara, and Shinya Sasayama, Tokyo, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed May 18, 1972, Ser. No. 254,469

Claims priority, application Japan, May 26, 1971, 46-35478

Int. Cl. G01b *11/00*

U.S. Cl. 356—4 **3 Claims**



A digital measuring apparatus for measuring the distance between two target lines formed on a test sample by the use of

circular scanning or the like includes an optical pulse scale disposed in such a predetermined relationship with the target lines as to correct any measurement error resulting from circular (or angular) scanning. A scanning system is disposed to scan the target lines and the optical pulse scale in a predetermined relationship, thereby producing optical target-line position signals and optical pulse scale signals. Photoelectric converter means are provided to convert the optical target-line position signals and the optical pulse scale signals into respective electrical signals. Target-line position signal detector means may detect the target-line positions from one of the said electrical signals. The electrical signals passed through the target-line position signal detector means may be formed into gate signals by a gate circuit. The other electrical signals passed through the gate circuit are counted by counter means.

3,791,736

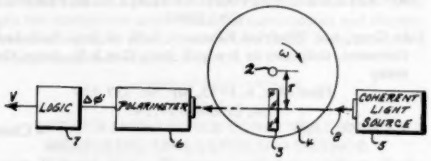
METHOD AND APPARATUS UTILIZING THE PHASE VELOCITY DIFFERENCE OF LIGHT RAYS FOR MEASURING THE VELOCITY OF A MOVING OBJECT

Ronald G. Newburg, Belmont, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 28, 1972, Ser. No. 248,585

Int. Cl. G01p *3/36*; **G01n** *21/40*

U.S. Cl. 356—27 **4 Claims**



Light transmitted through an optical birefringent retardation plate emerges as ordinary (O) and extraordinary (E) rays having a phase velocity difference characteristic of the plate material and thickness. Retardation plate motion introduces an additional phase velocity difference between the E- and O-rays that is a measure of the velocity of such motion. Velocity of a moving object is measured by affixing an optical retardation plate to the moving object, detecting the E- and O-ray phase velocity difference of coherent light transmitted through the moving plate, and converting the phase velocity difference values so obtained to linear and angular velocity values.

3,791,737

SPECTROMETER IN WHICH A DESIRED NUMBER OF SPECTRAL LINES ARE FOCUSED AT ONE FIXED OUTPUT SLIT

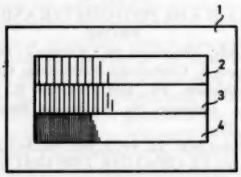
Axel Bernhard Johansson, Klensmedsvagen 40, 37 Hagersten, Sweden

Filed June 16, 1972, Ser. No. 263,777

Claims priority, application Sweden, June 8, 1971, 7945/71

Int. Cl. G01j *3/40*, *3/12*

U.S. Cl. 356—79 **3 Claims**



A spectrometer where spectral lines within a wide wavelength range with a high resolution can be focused at one fixed output slit by using a diffraction grating which consists of separate areas having different numbers of grooves per unit length, the grating being arranged to refract spectral lines in superimposition or in alignment with each other, the instrument being suitable for flame photometer determination of substances.

3,791,738

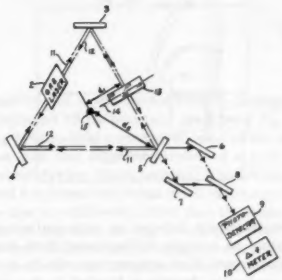
RING LASER UTILIZING AN OPTICAL RETARDATION PLATE TO PREVENT BEAM LOCKING

Ronald G. Newburgh, Belmont, Mass., assignor to The United States of America as represented by the Secretary of the United States Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 248,754, April 28, 1972, abandoned. This application Apr. 11, 1973, Ser. No. 350,260

Int. Cl. G01b *9/02*

U.S. Cl. 356—106 LR **5 Claims**



Ring laser beam locking is substantially eliminated by inserting an optical retardation plate into the circulating laser beams. The retardation plate is positioned with its optical axis perpendicular to the laser beams and is located at a point of minimum distance from the ring laser center of rotation. Further laser beam decoupling is achieved by mechanically vibrating the retardation plate.

3,791,739

INTERFEROMETER FOR X-Y MEASUREMENT

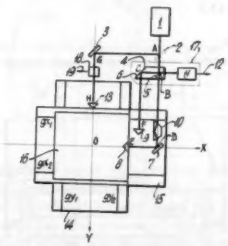
Harumi Kawasaki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Dec. 22, 1971, Ser. No. 210,964

Claims priority, application Japan, Dec. 30, 1970, 45/122567

Int. Cl. G01b *9/02*

U.S. Cl. 356—106 R **8 Claims**



An interferometer for measuring distances along coordinate axes including a pair of stages each movable in a direction along one of a pair of perpendicular co-ordinate axes, each carrying a mirror which travels along said axis. Each of said mirrors is respectively in the optical path along said axis of an associatedinterferometer means, each of the two interferome-

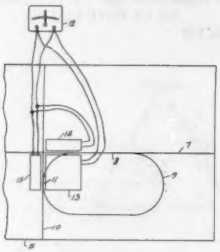
ter means being fed by a common light source, preferably a laser, and means associated with at least one of said interferometer means to introduce corrections for mechanical play in the system and corrections for relative rotation of the states about the intersection of the co-ordinate axes.

3,791,740

LOW COST HEADLIGHT TESTER AND METHOD

Paul R. Proefrock, Virden, Ill., assignor to Dura Corporation, Springfield, Ill.

Filed June 14, 1972, Ser. No. 262,602
Int. Cl. G01j 1/00
U.S. Cl. 356—121 **8 Claims**



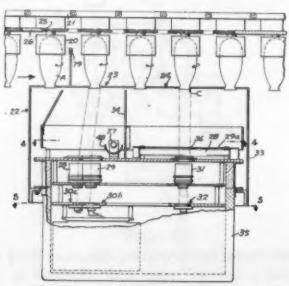
Three photoelectric devices are arranged cooperatively to enable reading on a single milliammeter both horizontal and vertical adjustments of an automotive vehicle headlight. One of the photoelectric devices is located in the high intensity zone of the testing area adjacent to a second of the photoelectric devices located in spaced relation above a predetermined desired position for the upper edge of the high intensity zone while the third photoelectric device is located in spaced relation relative to a predetermined desirable position for a vertical edge of the high intensity zone. Adjustments are effected sequentially, first either vertically or horizontally and then in the remaining mode with the milliammeter being read in each mode, and proper adjustment being determined by maximum reading attained on the milliammeter.

3,791,741

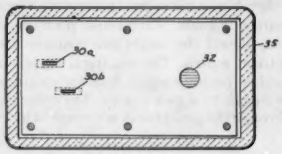
SIZE GAUGING AND QUALITY INSPECTING ROTATING ARTICLES BY IMAGING ONTO SPATIAL FILTERS AND DETECTORS

Irving R. Brenholdt, Greenwich, Conn., assignor to Farrand Optical Co., Inc., Valhalla, N.Y.

Filed Sept. 28, 1971, Ser. No. 184,475
Int. Cl. G01b 11/00
U.S. Cl. 356—163 **37 Claims**



Articles to be inspected are moved in a predetermined path through two successive inspection stations forming a part of a gauging assembly and are continuously rotated while moving through the inspection stations. The portion of the article to be gauged is illuminated at each inspection station and an image of the illuminated portion is directed through spatial filters of the Ronchi ruling type onto optical sensors which sense the modulation of the light passing through the spatial filters.



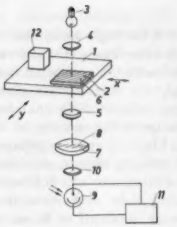
The modulated light is then electronically measured to produce electronic signals corresponding to the dimension or dimensional variation being inspected and, in addition, is compared with predetermined standards to produce a reject signal when the deviation from the predetermined standards is beyond a predetermined amount.

3,791,742

COORDINATE POSITION MEASURING BY IMAGING A MOVABLE GRATING ONTO A PARALLEL REFERENCE GRATING

Udo Grey, and Winfried Klimmer, both of Jena-Neulobeda, Germany, assignors to Jenoptik Jena G.m.b.H., Jena, Germany

Filed Mar. 6, 1973, Ser. No. 337,359
Int. Cl. G01b 11/14
U.S. Cl. 356—169 **4 Claims**



In order to position a slide relative to two coordinate directions, two gratings are used, the rules thereon being parallel to each other and non-parallel to neither of the coordinate directions and in which one of the gratings is integral with said slide.

The rules on the one grating are opaque whereas those on the other grating are transparent.

When the rules of the gratings coincide in the course of imaging the gratings on each other, signals will be derived at subsequent photocells.

3,791,743

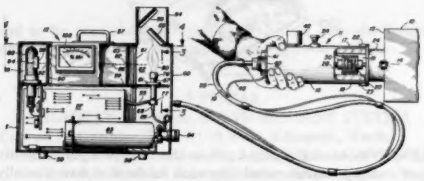
PORTABLE FLAME PHOTOMETER AND SAMPLING PROBE

Thomas E. Cody, Allentown, Pa.; Arthur L. Davison, Saugus, Calif.; Joseph A. Grohowski, Bethlehem; Geza J. Horvath, both of Bethlehem, Pa., and Theodore R. Linde, Coopersburg, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Mar. 21, 1973, Ser. No. 343,305
Int. Cl. G01n 21/58, 1/00; G01j 3/30
U.S. Cl. 356—187 **15 Claims**

A hand-held sampling probe remotely connected to a portable flame photometer enables immediate on-site identification of a desired piece of steel in a mixed stockpile thereof accord-

ing to a percentage concentration of manganese element in the steel. An operator causes the sampling probe to strike a low-voltage electric arc on a sampling surface of the test piece so as to generate an aerosol of atmospheric air and sample particles. An induction burner located in the flame photometer is fueled by a self-contained propane bottle and is adjusted to aspirate the aerosol and excite the sample particles in low-



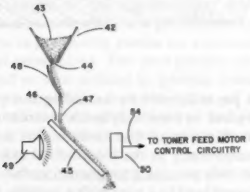
energy flame. Photoelectric circuits analyze the flame spectra and accumulate concentrations of iron as an internal standard and manganese as the identifying element. When the iron concentration reaches a predetermined value, a control unit interrupts the electric arc and element accumulations and displays percent manganese concentration on a meter without ratioing iron and manganese signals.

3,791,744

XEROGRAPHIC TONER CONCENTRATION MEASURING APPARATUS AND METHOD

Daniel Richard Erny, Boonton, and Leon Albert Tysko, Rockaway, both of N.J., assignors to Van Dyk Research Corporation, Whippany, N.J.

Filed Feb. 22, 1972, Ser. No. 227,965
Int. Cl. G01n *21/26*
U.S. Cl. 356—201 **9 Claims**



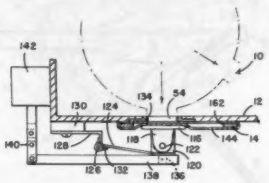
An arrangement for measuring the concentration of toner powder in a xerographic developer mixture by causing a sample of the developer to impinge upon a transparent plate. By providing the developer sample in the form of a turbulent stream, inclining the plate at the proper angle, and arranging the geometry of the measuring apparatus so that the stream impinges upon the transparent plate with the proper kinetic energy, a layer of toner powder is formed on the surface of a portion of the plate, the thickness of the toner layer increasing and decreasing with corresponding changes in the concentration of toner in the developer mixture. A photoelectric system is employed to monitor the light transmission of the toner-coated plate to provide a measure of toner concentration.

3,791,745

SPECTROPHOTOMETER ATTACHMENT FOR TESTING YARN DYEING QUALITIES

Richard MacHenry, Prospect Park, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Filed Dec. 26, 1972, Ser. No. 318,218
Int. Cl. G01j *3/46, 3/02*
U.S. Cl. 356—244 **5 Claims**



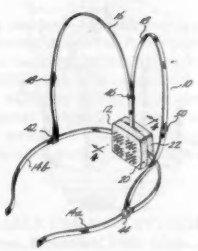
Dyeing qualities of yarns from different packages of yarn which are intended to be identical are tested by knitting a sleeve having longitudinal segments formed of the yarns to be tested and at least one segment formed of a yarn known to have the desired dyeing characteristics. The knitted sleeve is then dyed and it is found that some or all of the segments have accepted the dye to a different extent than the segment or segments knitted of the yarn having the desired dyeing characteristic. This application discloses an apparatus facilitating the checking by means of a spectrophotometer the depth of shade of the different longitudinal segments of the dyed knitted sleeve, whereby the yarns may be objectively classified as to dyeability.

3,791,746

BACK SCRUBBER

Francis L. Yearka, 10245 37th Pl. S.W., Seattle, Wash.

Filed Mar. 16, 1973, Ser. No. 342,202
Int. Cl. A47k *7/03*
U.S. Cl. 401—201 **11 Claims**



A two part resilient open cell foamed plastic is joined together. A strap is fastened between the two parts and extends outward in opposite directions from the joined parts. A pair of elastic straps are also joined between the plastic parts with both of these straps extending outward in the same direction which is at 90° from the first strap. The adjoining faces of the two plastic parts are joined part way around the periphery only, and are not joined on the side from which the elastic straps extend. One of the plastic parts has a series of outwardly extending holes into each of which a plurality of stiff fibers are embedded and extend outwardly from the foamed plastic.

3,791,747

FILE

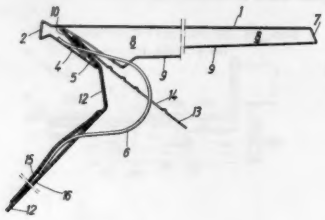
Carl Erik Grundell, Osmogatan 8, S-122 48 Enskede, Sweden

Filed Nov. 4, 1970, Ser. No. 86,913

Claims priority, application Germany, Nov. 10, 1969, 6943636

Int. Cl. B42f 3/00

U.S. Cl. 402—8 9 Claims



A file comprising at least one cover and at least one, preferably at least two spaced lugs whose ends are held at or near the spine of the file. Such lug or lugs extend between the file rear cover and a tab, which extends also from the spine only for part of the breadth of the file. These lugs are arranged perpendicular in relation to the file cover and are adapted to have their free ends inserted through holes provided in the tab after papers to be accommodated in the file and provided with holes have been placed on the lugs.

3,791,748

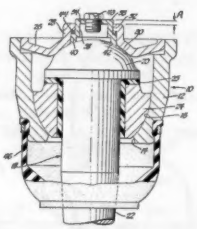
BALL JOINT WITH MANUALLY OPERABLE, SENSIBLE WEAR INDICATOR

Stanley R. Goodrich, Jr., Saginaw, and Jerry M. Roethlisberger, Bridgeport, both of Mich., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Apr. 17, 1972, Ser. No. 244,683

Int. Cl. F16b 7/00

U.S. Cl. 403—27 5 Claims



A ball joint subject to wear in normal use and having fixed internal bearing seats in its housing for the ball stud unit giving rise to play or lash as the wear takes place has a manually operable wear indicator. The indicator is mounted on the housing cover in telescoping relationship with respect thereto and is manually operable to accumulate the play occasioned by the wear as a spacing between the ball stud unit and the fixed bearing seat on the cover. Indications are provided by the indicator and the cover cooperatively to identify to the operator whether wear justifying replacement does or does not exist. Wear justifying replacement is indicated when the indicator is manually movable to a position having a predetermined relationship with the cover which is sensible by the operator.

3,791,749

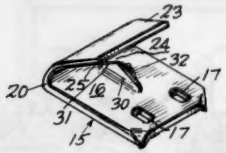
FURNITURE SPRING CLIP AND INSTALLATION

Thomas Grille, New York City; Daniel Krakauer, Great Neck, and Edwin G. Krakauer, Roslyn Heights, all of N.Y., assignors to Kay Manufacturing Corp., Brooklyn, N.Y.

Filed Nov. 11, 1971, Ser. No. 197,823

Int. Cl. F16b 7/04

U.S. Cl. 403—188 9 Claims



A stop element projects up from the base of a permanently open J-shaped sheet metal clip such as those conventionally used to hold the straight portion of the end bar of a wire furniture spring to a rail of the furniture frame. Progressive creeping of the end bar out of its seat in the clip is resisted by the stop element without the necessity of closing the clip. A single fastener such as one staple through the base holds the clip to the rail. The short imperforate flange or leg of the clip makes an angle of less than 90° to the perforated clip base and is permanently spaced from the stop element a distance not less than the diameter of the wire of the spring end bar.

3,791,750

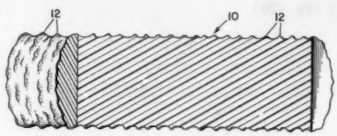
DOWEL

Herbert A. Cameron, 24 Brooks Ave., Lewiston, Maine

Filed May 15, 1972, Ser. No. 253,526

Int. Cl. E04b 1/48

U.S. Cl. 403—297 1 Claim



A dowel pin is formed by extruding hot plastic through a cooled die plate to form a cylindrical structure having on its surface a multiplicity of thin resilient fins most of which are disposed transversely to the longitudinal axis of the cylinder. The fins not only provide a roughened surface for better adhesion when combined in a joint with a suitable glue, but also exhibit plastic memory causing them to thrust against the wall of the bore in which the dowel is inserted, in order to effect a permanent joint. In one form the dowel is shaped with an hour-glass cross-section so that it may be inserted into a pair of overlapping bores and thereby provide greatly improved resistance to rotational forces.

3,791,751

ROD REPAIR SPLICE

Robert E. Vey, Elburn, Ill., assignor to Buffalo Brake Beam Company, Lackawanna, N.Y.

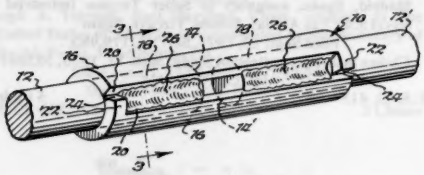
Filed Jan. 28, 1972, Ser. No. 221,629

Int. Cl. F16d 1/00

U.S. Cl. 287—111 10 Claims

A rod repair splice having a pair of trough shaped bodies each with a rod embracing and body locating flange at one end

thereof. The bodies are oppositely slidably mounted on the



rod to be repaired and welded along their opposite longitudinal edges to the peripheral surface of the rod sections.

3,791,752

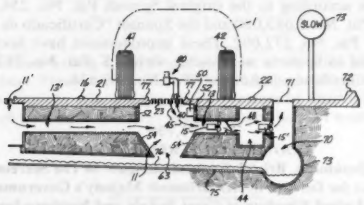
HIGHWAY DRAINAGE AND EXHAUST SYSTEM

Conrad O. Gardner, 22905 108 West, Edmonds, Wash.

Continuation-in-part of Ser. No. 14,300, Feb. 26, 1970, Pat. No. 3,610,360, which is a continuation-in-part of Ser. No. 545,117, April 25, 1966, Pat. No. 3,503,188. This application Sept. 30, 1971, Ser. No. 185,293

Int. Cl. E01f *5/00*

U.S. Cl. 404—2 **6 Claims**



Systems for receiving the noise and/or exhaust emmisions transmitted from motor vehicle exhaust outlet arrangements. The motor vehicle transmitter of noise and/or exhaust emmissions have a modified tail pipe arrangement arranged for close coupling and transmission of the noise and/or exhaust emmissions to receiving means for collecting and processing the noise and/or exhaust emmissions. The receiving means extends along the length of the highway and attenuates the received noise and/or collecting and passing the received exhaust emmissions to processing means for recovering or purifying the exhaust emmissions. The duct portion of the receiving means instead or also utilized to provide transmission of electric power to specially designed types of electrically powered motor vehicles along the highway and also provide guidance where it is so desired to instrument the vehicle and duct.

3,791,753

ROAD CONSTRUCTION APPARATUS

Karl Heinz Rymsa, Horbach, Germany, assignor to Wibau-Westdeutsche Industrie-und Strassenbau-Maschinen-Gesellschaft m.b.H., Wilbaustr, Germany

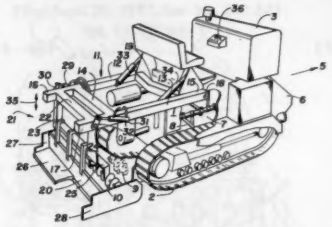
Filed Mar. 27, 1972, Ser. No. 238,432

Claims priority, application Germany, Mar. 27, 1971, 2115040

Int. Cl. E01c *19/00*

U.S. Cl. 404—84 **11 Claims**

The present road construction apparatus has a frame supported plank extending across the road to be constructed for installing a road forming composition in a road bed. The frame and installing plank or bar are supported on a carriage and relative to each other in such a manner that the plank may be raised and lowered as a unit or each plank end may be raised and lowered independently of the other plank end. In addition the plank is shiftable back and forth horizontally across the length of the road. The operation of the plank is accomplished



by sensor responsive power means which may also be operator controlled.

3,791,754

TROWELLING MACHINE

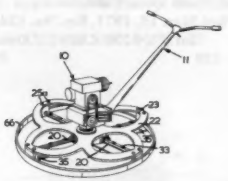
Francesco Zochil, 10 Cortina Cres., Hamilton, Ontario, Canada

Filed Jan. 10, 1972, Ser. No. 216,557

Claims priority, application Canada, May 14, 1971, 113026

Int. Cl. F01c *19/22*

U.S. Cl. 404—112 **10 Claims**



A trowelling machine, for finishing cementitious surfaces, of the type having a central hub rotatable by an engine mounted above the hub, the hub having radial carriers which support trowelling blades. In accordance with the invention the outer ends of the trowelling blade carriers are supported by a blade support assembly including a cast steel support member which member is specially designed to resist upwards deflection of the outer ends of the blade carriers.

3,791,755

ADJUSTABLE DRILL ON ATTACHABLE BASE

Wesley S. Warren, Bloomfield Hills, Mich., assignor to General Automation Manufacturing, Incorporated, Troy, Mich.

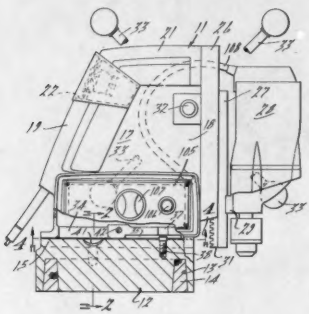
Filed Nov. 25, 1970, Ser. No. 92,750

Int. Cl. B23b *45/14*

U.S. Cl. 408—76 **8 Claims**

A base has means by which it is attached to a workpiece to be drilled with one portion of a dovetail slide thereon which cooperates with the other portion of the dovetail slide on the frame which supports the drill unit. After the base is secured on the workpiece, the frame and drill unit may be moved forwardly or rearwardly along a longitudinal plane. The base may be provided with a pivoted section which has the one portion of the dovetail thereon so that after the base is clamped to the workpiece, the drill point may not only be adjusted longitudinally but also sidewardly so that it may be located exactly over the point at which drilling is to occur. This permits the

base element to be attached to the workpiece with the drill point in approximate position or adjacent to a plurality of



positions after which it may be located over the point or points on the workpiece at which drilling is to occur.

3,791,756

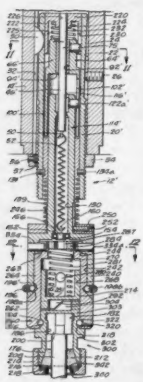
TAPPING SPINDLE WITH TORQUE RELEASE CLUTCH BUILT INTO ITS SHANK AND HAVING AUTOMATIC DEPTH CONTROL

Allan S. Johnson, Newport Beach, Calif., assignor to Tapmatic Corporation, Costa Mesa, Calif.

Filed Mar. 15, 1971, Ser. No. 124,020

Int. Cl. B23b *47/24, 31/04*

U.S. Cl. 408—139 **2 Claims**



A tapping spindle having a shank with a torque release clutch built into the shank so that the overall size is reduced adapting it for use in a machine carrying multiple closely spaced spindles. The clutch comprises a driving sleeve and a driven sleeve member, and is combined with an automatic depth control in the spindle. In one form the tapping spindle has a removable tool chuck holder having the torque release chuck built into it, the holder being rotatable relative to the spindle.

3,791,757

NEW TYPE OF ROTARY PUMP FOR LIQUIDS

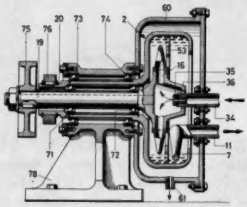
Carlos Sanchez Tarifa, and Jacobo Valdes Pedrosa, both of Madrid, Spain, assignors to Sener Tecnica Industrial Y Naval S.A., Las Arenas, Bilbdo, Vizcaya, Spain

Filed Sept. 13, 1971, Ser. No. 179,983

Claims priority, application Spain, Sept. 11, 1970, 383567

Int. Cl. F04d *1/14*

U.S. Cl. 415—89 **5 Claims**



The invention herein described refers to the introduction of improvements, development of new components, new types and new arrangements of the high pressure rotary hydraulic pumps according to the original Spanish Pat. No. 256,654, U.S. Pat. No. 3,093,080 and the Spanish "Certificado de Adicion" Pat. No, 272,092. These improvements have been registered in Spain in accordance with U.S. Pat. No. 383,567 and "Certificado de Adicion" Pat. No. 389,338.

3,791,758

COOLING OF TURBINE BLADES

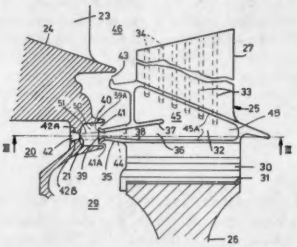
John Jenkinson, Bristol, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed May 1, 1972, Ser. No. 249,140

Claims priority, application Great Britain, May 6, 1971, 14,172/71

Int. Cl. F01d *5/08*

U.S. Cl. 415—116 **7 Claims**

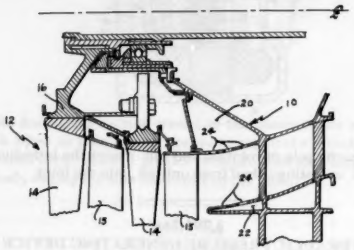


The disclosure of this invention pertains to a gas turbine engine in which cooling air is blown from nozzles in a stationary structure into an annular array of inlet openings in a turbine rotor. The inlet openings lead to passages for supplying the cooling air to turbine blades. The passages are defined by radial walls extending downstream of the inlet openings and shaped to define splitters in respect of the flow through the inlet opening so that the latter is effectively a circumferentially continuous opening. Thereby diffusion of the flow from the nozzles to the openings is facilitated.

3,791,759
TURBINE PRESSURE ATTENUATION PLENUM CHAMBERS

Joseph A. Tetrault, East Hartford, Conn., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 7, 1972, Ser. No. 260,645
Int. Cl. F01n *27/02*; F04d *29/68*
U.S. Cl. 415—119 3 Claims

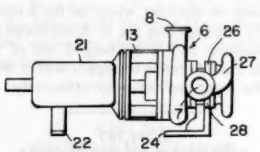


A turbine having a plurality of pressure attenuation plenum chambers. These chambers are located adjacent the vanes of a turbine thereby relieving the excess pressure by distributing it through a series of apertures in the plenum chamber walls.

3,791,760
UNIVERSAL IN LINE AND END SUCTION PUMP ARRANGEMENT

Bruce R. Lipe, Cincinnati, Ohio, assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed July 31, 1972, Ser. No. 276,848
Int. Cl. F04d *29/40, 17/08*
U.S. Cl. 415—121 1 Claim

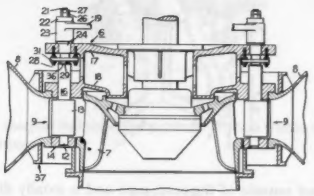


A centrifugal pump having an inlet and a discharge with a universal mounting surface positioned about the inlet. An extension to the inlet including a pump supporting foot can be attached to the universal mounting surface. Additionally, an in line pump inlet can be attached to either the foot support inlet or the pump inlet to provide an inlet to the pump in line with the pump discharge.

3,791,761
THRUST ADJUSTING MECHANISM FOR HYDRAULIC TURBINE WICKET GATES

Gerald L. Hayes, York, Pa., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sept. 29, 1972, Ser. No. 293,543
Int. Cl. F01d *9/00*
U.S. Cl. 415—163 1 Claim

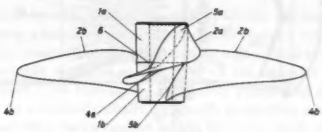


Means are provided for limiting the axial thrust of the turbine wicket gates. A plate adjustably connected to the turbine headcover is selectively positioned relative to a shoulder on the wicket gate shaft to provide the proper thrust clearance.

3,791,762
SHIP'S PROPELLER

Hans Brehme, Hamburg, Germany, assignor to Theodore Zeise, Hamburg, Germany

Filed May 27, 1971, Ser. No. 147,466
Claims priority, application Germany, May 29, 1970, P 20 26 290.2
Int. Cl. B44d *3/06*; B63h *1/20*
U.S. Cl. 416—198 6 Claims



A ship's propeller has two coaxial hub members and a plurality of blade members, one or more on each of the hub members. Each of the blade members is integral with and radially projects from one of the hub members and its root extends in part to the other hub member. The blade members each have a radially outward blade area and all areas of the blade members together form a propeller shape having blades located in a common propeller plane transverse of the axis of the hub members.

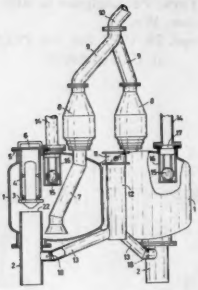
3,791,763
PUMP USED IN DREDGING SYSTEMS OPERATING WITH COMPRESSED AIR

Giovanni Faldi, Via Forese Donatu, 27, Firenze, Italy

Filed Feb. 22, 1972, Ser. No. 228,006
Claims priority, application Italy, Mar. 16, 1971, 21851 A/71
Int. Cl. F04f *1/06*; E02f *3/88*
U.S. Cl. 417—118 3 Claims

An improvement in the pumps, used in the dredging systems and operating with compressed air, is disclosed, wherein foreign materials, tending to interfere with the operation of the inlet valve and at times to clog the supply pipe of the compressed air, are prevented from entering into the said pipes, by means of an inlet pipe for the dredged material the discharge

opening of which is not flushed with the bottom of the pump casing and the closure member for the said discharge opening



is positioned outside of the inlet pipe and is axially displaced with respect to the inlet pipe and above the same.

3,791,764

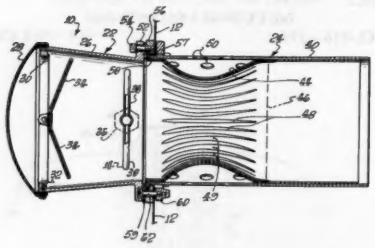
VARIABLE AREA RATIO JET PUMP

James R. Summer, Brielle, N.J., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Mar. 1, 1972, Ser. No. 230,904

Int. Cl. F04f *5/48*

U.S. Cl. 417—185 **2 Claims**



A jet pump having a large ratio of the area of the mixing tubular member to the primary nozzle or nozzles area, is arranged for constriction of the mixing tube upon the application of fluid pressure on the exterior surface, resulting in a gradually decreasing mixing tube throat with a resulting considerable decrease in the area ratio.

3,791,765

LIQUID PUMP, PARTICULARLY A FUEL-OIL PUMP

Gunnar Lyshoji Hansen, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

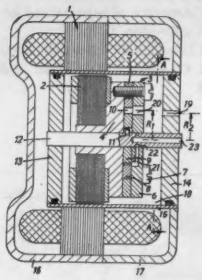
Filed Oct. 15, 1971, Ser. No. 189,537

Claims priority, application Germany, Oct. 17, 1970, P 20 51 036.5

Int. Cl. F04b *17/00*

U.S. Cl. 417—357 **3 Claims**

The invention relates to a pump assembly which may be utilized as a fuel oil pump and which has constructional features which minimize the possibility of air binding. The assembly has a rotating casing member in which pumping elements are housed and which is surrounded by a casing so as to form a suction chamber which surrounds the rotating casing member. The rotation of the casing member causes liquid in the suction chamber to also rotate and form a ring of liquid. The rotating casing member has an eccentrically positioned inlet which passes through the ring of liquid so formed once during each cycle of rotation and this insures the introduction of liquid, as distinguished from only air, into the inlet.



3,791,766

HYDRAULIC PRESSURE GENERATING DEVICE

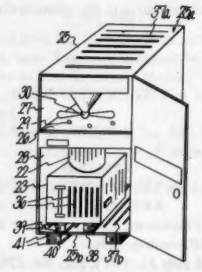
Aisaku Kikutsugi, Kawasaki, and Yoshihisa Shimoyama, Tokyo, both of Japan, assignors to Kabushikikaisha Tokyo Keiki (Tokyo Keiki Co., Ltd.), Tokyo, Japan

Filed Feb. 2, 1972, Ser. No. 222,848

Claims priority, application Japan, Feb. 27, 1971, 46/12444

Int. Cl. F04b *39/06*

U.S. Cl. 417—363 **9 Claims**



A hydraulic pressure generating device having a housing with air holes formed at least in its upper and lower walls, a partition wall with air holes to divide the housing into upper and lower rooms, a fan located in the upper room of the housing, a pressure compensation variable discharge type pump, a motor mounted in the lower room for driving the pump, and an oil tank disposed in the lower room and having soaked therein the pump. In this case, when the fan is operated, air is sucked into the housing from the air holes bored in the lower wall of the housing and is discharged out of the housing through the air holes bored in the upper wall of the housing to thereby cool the pump and the motor effectively.

3,791,767

DIALYSIS PUMPING SYSTEM

Karl Shill, 38171 Ashford Way, Fremont, Calif.

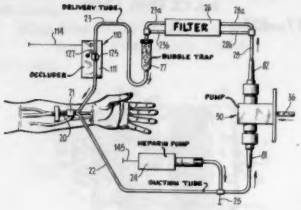
Filed Mar. 15, 1972, Ser. No. 234,935

Int. Cl. F04b *9/10*

U.S. Cl. 417—389 **4 Claims**

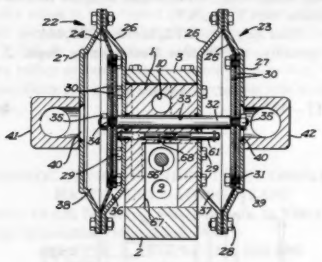
This invention relates to a dialysis pump and pumping system primarily designed for the pumping of blood for purification in an "artificial kidney machine" using the recently announced system of the use of a single needle temporarily inserted into a vein or artery of a patient through which blood is withdrawn from the vein for purification and returned to the

patient through the same needle. Such a dialysis system requires a device, commonly called an "occluder," by means of which blood from the filter is prevented from entering the



needle during the suction stroke of the pump of the machine and is open to flow during the pumping stroke which, in the preferred form, exerts a greater pressure than that supplied by the body during the suction stroke of the pump.

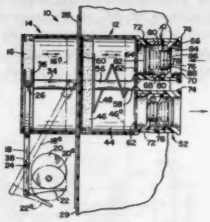
3,791,768
FLUID PUMP
William F. Wanner, 5805 View Ln., Minneapolis, Minn.
Filed June 16, 1972, Ser. No. 263,692
Int. Cl. F04b *17/00, 35/00*
U.S. Cl. 417—393 **3 Claims**



A pair of fluid pressure operated diaphragm pumps, the diaphragms of which are disposed in separate housings and connected together for common reciprocatory movements. A valve body provides support for the housings and for a connection between the diaphragms. The valve body contains a reversing valve, a pilot valve, and a pressure relief valve in a pump operating fluid circuit which includes primary pressure chambers in the housings at one side of the diaphragms. The housings define secondary chambers at the other side of the diaphragms for pumping fluids isolated from the pump operating fluids.

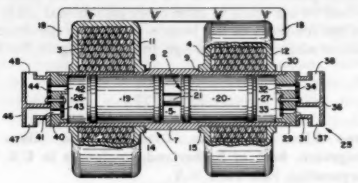
3,791,769
MAGNETIC HEART PUMP
Stephen G. Kovacs, 23 Rockaway St., Clearwater Beach, Fla.
Filed June 4, 1970, Ser. No. 43,519
Int. Cl. F04b *17/04*
U.S. Cl. 417—417 **7 Claims**

A magnetically driven heart pump wherein relative movement between opposing magnetic fields induce pump piston motion, which simulates the pulsatile pumping action of a natural heart. The heart pump has two separate parts. The first part comprises the pumping and valve chambers, and is adapted to be imbedded within the chest cavity. The second part, adapted to be strapped to the exterior of the chest wall, carries the magnet and mechanical linkage. The motion of the



exterior magnet induces pump piston motion within the pumping chamber.

3,791,770
ELECTROMAGNETIC PUMP OR MOTOR DEVICE WITH AXIALLY SPACED PISTON MEMBERS
Robert A. Farkos, 63 York Rd., Hudson, Ohio
Filed May 24, 1973, Ser. No. 363,332
Int. Cl. F04b *17/04*
U.S. Cl. 417—418 **9 Claims**

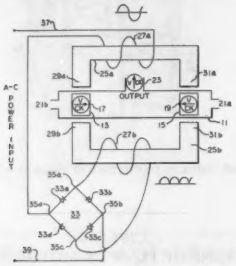


An electromagnetic pump or motor device includes a cylinder having a bore selectively sealed at its ends by removable valve plate assemblies communicating with a fluid system, a piston assembly movable in the bore of the cylinder, and spaced solenoid coils removably accurately positioned about the cylinder by a central radially outwardly projecting annular rib having two stop faces against which the inner ends of the coil housings abut, said solenoid coils being alternately energized to produce respective magnetic fields alternately for attracting the piston assembly to reciprocate the same in the bore. The piston assembly includes two spaced cylindrical pistons joined by a non-magnetic connecting pin or coupling, the piston assembly being of sufficient length to position a part of one piston radially inside the non-energized coil at the end of the piston assembly stroke, whereby such one piston is in a strong magnetic field for the return stroke of the cycle.

3,791,771
PUMP HAVING MAGNETICALLY DRIVEN RECIPROCATING PISTONS
John F. Roesel, Jr., Rt. No. 2, Box 281-M, Upper Manatee River Rd., Bradenton, Fla.
Filed Dec. 23, 1971, Ser. No. 211,183
Int. Cl. F04b *17/04, 35/04, 39/10*
U.S. Cl. 417—418 **7 Claims**

A pump wherein the pumping takes place in an elongated chamber having first and second magnetic material piston members therein, at least one member being moveable and at least said one moveable member having check valve means therein so that liquid is flowed through the check valve means as the members are separating and the relative movement towards each other of the sections closes the check valve means. A unidirectional flow outlet between the members al-

lows the liquid to be pumped out by the relative movement of the piston members. Facing each other on the outside of the chamber are first and second horseshoe electromagnets with first and second coils around each horseshoe. Connected to the first set of coils is an AC to DC converter to supply DC power to the coil, whereas the second coil has a line for connection to an AC source. The first coil, the converter and the second coil are in series so that the first horseshoe magnet



presents alternating North and South poles, while the second horseshoe magnet has fixed North and South poles. When plugged into a line, the fixed poles are alternately presented with a similar and a different opposed pole. This causes the moveable piston members to be attracted to the poles on one cycle and be attracted to each other on the next cycle by virtue of the tendency of the pistons to move in the direction of maximum magnetic flux linkage, thus pumping the fluid.

3,791,772

VACUUM CLEANER FAN ASSEMBLY

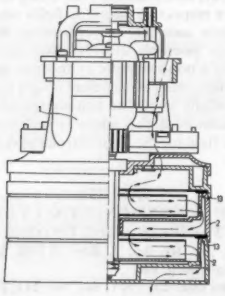
Keimpe Klaas Keimpema, Drachten, and Klaas Vonk, Hoogeveen, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 1, 1971, Ser. No. 185,759

Claims priority, application Netherlands, Oct. 3, 1970, 7014555

Int. Cl. F04b *17/00*; **F04d** *29/44*

U.S. Cl. 417—423 A **1 Claim**



A vacuum cleaner fan assembly consisting of a compressor and an electric motor. A diffuser housing is provided, comprising a ring of guide blades constituting a radial diffuser in which ducts are provided for bypassing the air in the axial direction. The guide blades are supported by sealing means between the housing and an appropriate lid.

3,791,773

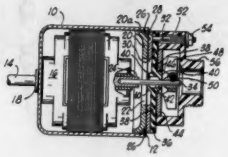
SUBMERSIBLE PUMP

Francis Maginnis, Norman, Okla., assignor to Little Giant Corporation, Oklahoma City, Okla.

Filed June 9, 1972, Ser. No. 261,435

Int. Cl. F04b *17/00*

U.S. Cl. 417—423 **11 Claims**



The disclosure relates to an improved resin encapsulated submersible electrically driven pump of the centrifugal type. The pump unit utilizes a novel sealing gasket arrangement for establishing a seal between the impeller housing and the back support plate, and for establishing a high integrity seal around the shaft extension element.

3,791,774

VACUUM CLEANER UNIT

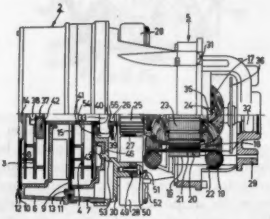
Klaas Vonk, Hoogeveen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 31, 1972, Ser. No. 285,441

Claims priority, application Netherlands, Sept. 2, 1971, 7112062

Int. Cl. F04b *17/00*

U.S. Cl. 417—423 A **4 Claims**



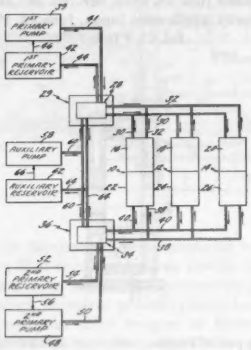
Vacuum cleaner unit comprising a compressor and an electric commutator motor built so as to adjoin the compressor, in which air which in operation emanates from the compressor is used to cool the motor and for this purpose is directed through the motor by means of baffle plates and furthermore is used to conduct away carbon-brush detritus due to wear of the carbon brushes, thereby preventing the detritus from depositing on the motor and in particular on the coils. The commutator with the carbon brushes is positioned between the rotor of the motor and the compressor. A carbon-brush detritus collecting plateau is located at the compressor end of the commutator. The carbon-brush detritus is moved from the commutator circumference towards the compressor by air vorticles produced near the commutator and is deposited on the collecting plateau.

3,791,775

HYDRAULIC FLUID SUPPLY APPARATUS FOR A HYDRAULIC SERVOMECHANISM

Gregory Bochnak, and Roderick A. MacLennan, both of Stratford, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed June 19, 1972, Ser. No. 263,884
Int. Cl. F04b 41/06, 23/04
U.S. Cl. 417—426 5 Claims



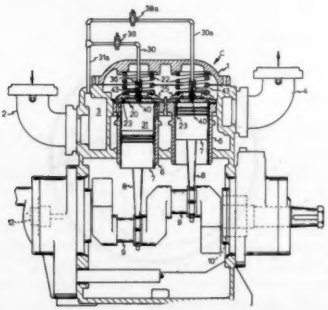
Under normal operating conditions a primary pump and a primary reservoir comprise the hydraulic fluid supply apparatus for each of two stages of a hydraulic servomechanism. A transfer valve is responsive to the difference of the hydraulic fluid pressures of each primary pump and an auxiliary pump. A failure which causes a reduction in the pressure provided by either or both primary pumps causes the connection of the auxiliary pump and an auxiliary reservoir to the respective stage.

3,791,776

RECIPROCATING CYLINDER TYPE COMPRESSOR HAVING UNLOADING MEANS

Whitney I. Grant, Muskego, Wis., assignor to Vilter Manufacturing Corporation, Milwaukee, Wis.

Filed Apr. 3, 1972, Ser. No. 240,590
Int. Cl. F04b 49/02
U.S. Cl. 417—440 2 Claims



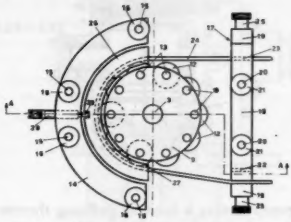
Unloading means for a reciprocating type compressor, for refrigeration equipment or the like, said means placing the discharge chamber in communication with the suction side of the compressor and including a one-way valve and means for actuating the valve at the proper time. The arrangement is such that the individual cylinders of a multi-cylinder compressor can be independently unloaded as desired.

3,791,777

PERISTALTIC PUMP WITH A PLURALITY OF CONTINUOUSLY ADJUSTABLE CHANNELS

Paolo Papoff, Bari, and Sebastiano Impedovo, Putignano, both of Italy, assignors to Snam Progetti S.p.A., Milanese, Italy

Filed Oct. 8, 1971, Ser. No. 187,643
Claims priority, application Italy, Oct. 8, 1970, 30722/70
Int. Cl. F04b 43/08, 43/12, 45/06
U.S. Cl. 417—475 2 Claims



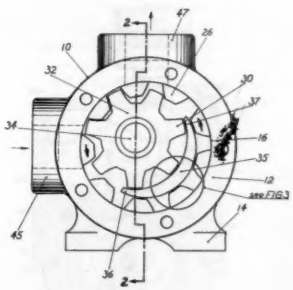
A novel peristaltic pump is disclosed which comprises a support base, a shaft mounted for rotation on said support base, a rotor means mounted on said shaft at one side of said support base, motor means for driving said shaft mounted on the opposite side of said support means, said rotor means having spaced around its periphery a plurality of force bearings, in a plurality of rows spaced axially along said rotor, a half jaw mounted around the periphery of said rotor means, said half jaw having a plurality of stacked-grooved sectors spaced axially along said rotor means, said plurality of stacked-grooved sectors having individual means for independent adjustment of the radial depth of each of said stacked-grooved sectors.

3,791,778

FOAM GENERATOR

Robert E. Eron, 3375 34th St., North, St. Petersburg, Fla.

Continuation-in-part of Ser. No. 771,704, Oct. 30, 1968, abandoned. This application Dec. 8, 1970, Ser. No. 96,105
Int. Cl. F01c 1/14
U.S. Cl. 418—15 13 Claims

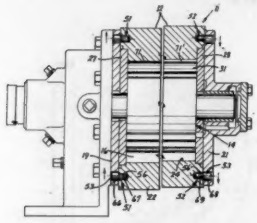


A method and apparatus for simultaneously generating and pumping foam. As air is being pumped, foam solution is transmitted through a number of bores formed in the pump's pumping members, whereupon foam is generated when the solution emerges from the bores and is discharged at the pump's outlet. Additionally the pumping members are designed to meter, through a plurality of inlet ports, amounts of different chemicals of foam solution into the pump.

3,791,779
PUMP ROTOR ADJUSTMENT MECHANISM

Richard E. Nelson, Grand Rapids, Mich., assignor to Dover Corporation, Grand Rapids, Mich.

Filed July 31, 1972, Ser. No. 276,563
Int. Cl. F01c *21/16*
U.S. Cl. 418—30 **2 Claims**

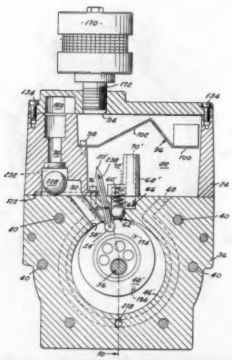


A rotary pump having a housing defining therein a pump chamber and a rotor disposed within said pump chamber for pumping fluid between inlet and outlet ports. The rotor includes slidable vanes which slidably engage an internal guide surface formed on a ringlike cylinder. The ringlike cylinder is fixedly connected to a pair of head members which define opposite ends of the pump chamber and rotatably support the rotor shaft. A plurality of eccentric pins are fixedly connected between each head member and the adjacent axial end of the cylinder for permitting the cylinder, when the pump is being assembled, to be selectively positioned in one of at least two predetermined positions relative to the head members to permit the minimum clearance between the rotor and the inner guide surface to be selected in accordance with the type of fluid to be pumped.

3,791,780
VACUUM PUMP

Junior L. Fritch, Edgerton, and Don R. Brandeberry, Montpelier, both of Ohio, assignors to Robinair Manufacturing Corporation, Montpelier, Ohio

Filed May 11, 1972, Ser. No. 252,213
Int. Cl. F01c *21/04*; F04c *27/02, 29/02*
U.S. Cl. 418—60 **13 Claims**

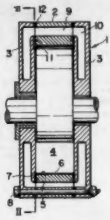


An improved vacuum pump of the rotary mechanical type having interchangeable component parts which may be assembled in "building block" fashion to provide single and multistage pumps built up from the same basic parts. The multistage pump may be provided with a switchable feature whereby the stages may be operated in series or in parallel, with automatic switching therebetween if desired. Both air ballast and oil injection are provided, the latter incorporating a check valve to control the supply of oil to the pumping chamber.

3,791,781
ROTARY PISTON INTERNAL COMBUSTION ENGINE

Tetsuo Fujiyama, and Takashi Hamamoto, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed June 29, 1972, Ser. No. 267,263
Claims priority, application Japan, June 29, 1971, 46/56728
Int. Cl. F16m *1/04*
U.S. Cl. 418—179 **7 Claims**

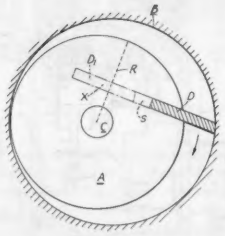


In a rotary piston engine, anti-wear treatment such as metal spray, etc., is provided on a fixing surface of a center housing and side housings and particularly the fastening surface around the plug hole, in order to prevent abnormal wear of the fastening surface and the consequent disadvantage caused by abnormal wear.

3,791,782
ROTARY PUMPS

Robert Horne, Cheltenham, England, assignor to Lacy-Hulbert and Company Limited, Beddington, Croydon, Surrey, England

Filed Nov. 22, 1972, Ser. No. 308,821
Claims priority, application Great Britain, Dec. 20, 1971, 58,992/71
Int. Cl. F01c *1/00*; F04c *1/00*
U.S. Cl. 418—236 **1 Claim**



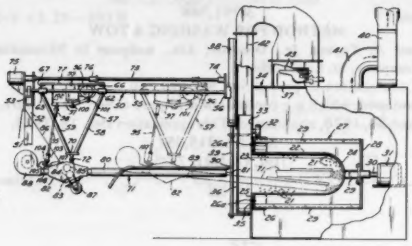
A pump of the eccentric rotor offset sliding blade type has the blade slots of such depth, in relation to the length of blades approaching the fully worn condition, that upon re-starting after stoppage worn blades remain retracted in their slots and cannot escape to cause jamming and damage to the pump.

3,791,783

APPARATUS FOR FORMING FIBER PREFORMS

Ronald L. Damon, Thompson, and Arthur J. Wiltshire, Cleveland, both of Ohio, assignors to Structural Fibers, Inc., Chardon, Ohio

Filed June 28, 1971, Ser. No. 157,434
Int. Cl. B29c 5/04, 5/06
U.S. Cl. 425—82 4 Claims



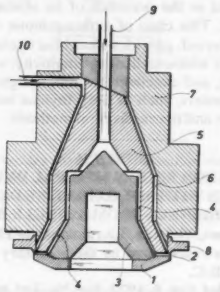
A machine for fabricating fibrous preforms which may be used in molding fiber-reinforced plastic articles by impregnating the preform with a suitable thermosetting resin. The preform is a unitary, seamless, porous cylinder having a closed bottom and comprises short lengths of fibers which are bonded together by a cured resin binder. The machine according to this invention includes a screen form which defines the shape of the preform to be formed. The form has an open mouth, a cylindrical sidewall, and a closed opposite end and is mounted for rotation about its horizontal axis. The outside surface of the screen form is substantially enclosed by a chamber, and an exhaust fan is provided in the chamber to draw air through the form from the inside to the outside thereof. A fiber dispenser, which comprises a tube, extends into the screen form and includes a chopper at one end for chopping continuous filaments into short lengths. The chopped filaments are blown through the tube and are deposited on the screen as the screen is rotated. The tube is mounted on a carriage and is movable from an initial position wherein its discharge mouth is located closely adjacent the center of the closed end of the screen, to a position which is closely spaced from the sidewall of the screen, and then along the sidewall to the open mouth of the screen. A binder resin dispenser is provided adjacent the discharge mouth of the tube so that the binder resin is deposited on the fibers as they are deposited on the screen.

3,791,784

CONTINUOUS EXTRUSION MACHINE FOR MANUFACTURING PLASTIC NETS

D. Ignacio Aurrecoechia Arechavaleta, Bilbao, Spain, assignor to Triker S.A., Bilbao, Spain

Filed Nov. 13, 1972, Ser. No. 305,928
Claims priority, application Spain, Nov. 6, 1971, 396735
Int. Cl. B29f 3/04
U.S. Cl. 425—132 7 Claims



A continuous extrusion machine for manufacturing a net like mesh: the machine includes a circular housing having first and second adjacent outlets near its base; one extrusion outlet includes means for extruding longitudinal ribs which means is replaceably fastened at the end of the housing; the other extrusion outlet is shaped to produce transverse ribs and to deposit the transverse ribs on the longitudinal ribs; each outlet communicates with a separate extrusion pressure chamber, whereby two different materials may be extruded; blocking means at the exterior of the housing are shifted between a position which blocks the second outlet and one which opens the second outlet, thereby selectively cutting off or permitting flow out the second outlet to produce spaced transverse ribs.

CHEMICAL

3,791,785
AROMATIC POLYESTER TEXTILE FIBERS DYED WITH BIS(ARYLAMINO) DIHYDROXYANTHRAQUINONE DYES

Raouf Botros, Lock Haven, Pa., assignor to American Aniline Products, Inc., Lock Haven, Pa.

Continuation-in-part of Ser. No. 222,361, Jan. 31, 1972. This application May 17, 1972, Ser. No. 253,995
Int. Cl. D06p *3/54*; **C07c** *97/14*; **C09b** *1/50*
U.S. Cl. 8—39 **5 Claims**

Aromatic polyester textile material is dyed with anthraquinone dyes made by the reaction of an arylamine, such as aniline, with a dichloro-dihydroxyanthraquinone in which one of the chlorine atoms is in a non-peri position, the reaction being conducted in the presence of an acid acceptor and a copper catalyst. This class of anthraquinone dyes, when appropriately dispersed, provides clear blue dyeings on aromatic polyester fabrics with excellent substantivity, very good sublimation fastness, and excellent fastness to light. The dyes are applied to polyesters, such as polyethylene terephthalate, by carrier, pressure and thermofixation methods.

3,791,786
PROCESS FOR BROWN MINERAL DYEINGS OF CELLULOSICS WITHOUT OXIDATIVE DEGRADATION (TENDERING), FROM A SINGLE BATH

Charles J. Conner, Metairie, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

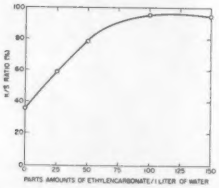
Filed Apr. 5, 1972, Ser. No. 241,461
Int. Cl. D06p *3/60*
U.S. Cl. 8—52 **2 Claims**

Cellulosic textiles have been imparted controllable shades of "bistre-brown" or of "reddish-brown" coloration which have proved to be durable to laundering. These coloration have been imparted mainly to cotton fabrics through single bath mineral dyeings with inorganic compounds or mixtures thereof by impregnating the cellulosic textile with an aqueous solution containing potassium permanganate and a methylolated ethylene urea, removing the excess solution, then curing the wet impregnated textile. The reddish-brown varieties are prepared by incorporating small quantities of zirconia in the solutions. Whereas the treatment with permanganate alone severely degrades the cellulosic by oxidation, the incorporation of a methylol urea inhibits the cellulosic oxidation and subsequent degradation.

3,791,787
PROCESS FOR DYEING CELLULOSE FIBERS

Yasushi Yamada, Yono; Hiroomi Hosoi, Urawa; Hiroaki Ohno, Tokyo, and Teruhito Sotogoshi, Yono, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed July 27, 1972, Ser. No. 275,575
Claims priority, application Japan, Aug. 5, 1971, 46-58668; Aug. 5, 1971, 46-58669
Int. Cl. D06p *3/66*
U.S. Cl. 8—54.2 **10 Claims**

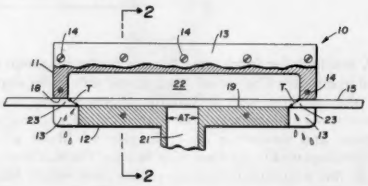


Cyclic alkylene carbonates or inorganic salts containing fluorine are used as reaction promoters in the fixation of reactive dyestuffs (other than those of resin type) to cellulose fibers under nearly neutral conditions.

3,791,788
METHOD FOR WASHING A TOW

Ernest A. Taylor, Jr., Decatur, Ala., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 198,780, Nov. 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 51,261, June 30, 1970, abandoned. This application Dec. 18, 1972, Ser. No. 315,951
Int. Cl. D01f *7/06*
U.S. Cl. 8—137.5 **13 Claims**



A method for washing a tow wherein the tow is passed through a confined zone and a stream of water is forced through the tow at a minimum rate at least as great as

$$x = 1{,}000T \quad WN/h\,(\mu/\rho)$$

where x is the water flow rate in gallons per minute, T is the thickness of the stream of water in inches, W is the width of the confined zone in inches, h is the thickness of the confined zone in inches, N is the number of filaments in the tow, μ is the viscosity of the water in pounds per foot-second, and ρ is the density of the water in pounds per cubic foot. Preferably, the water is forced through the tow at a rate at least 3 times the minimum rate.

3,791,789
1,2-DITHIOLIUM COMPOUNDS AS CORROSION INHIBITORS

Bernardus A. Oude Alink, St. Louis, Mo., assignor to Petrolite Corporation, Wilmington, Del.

Division of Ser. No. 79,709, Oct. 9, 1970. This application June 22, 1972, Ser. No. 265,243
Int. Cl. C23f *11/04*, *11/16*
U.S. Cl. 21—2.5 R **18 Claims**

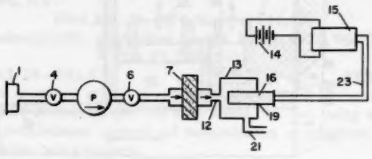
1,2-dithiolium compounds are prepared by oxidizing 1,2-dithiole-3-thiones. In general, aliphatic-substituted dithiolium compounds have been found to be more stable and more water-soluble than aryl-substituted dithiolium compounds. Dithiolium compounds are useful as corrosion inhibitors in aqueous and/or aerated and/or acidic systems. Their usefulness as corrosion inhibitors is enhanced by the high water solubility and stability of the aliphatic-substituted dithiolium compounds.

3,791,790

PORTABLE PURIFICATION DEVICE FOR FLUIDS

John L. Wyndham; Wayne E. Stevens, and Philip J. McCauley, all of El Paso, Tex., assignors to Intertech Corporation, El Paso, Tex.

Continuation of Ser. No. 782,657, Dec. 10, 1968, abandoned. This application Nov. 16, 1971, Ser. No. 199,156
Int. Cl. C02b 3/00; A61l 3/00
U.S. Cl. 21—102 R 7 Claims



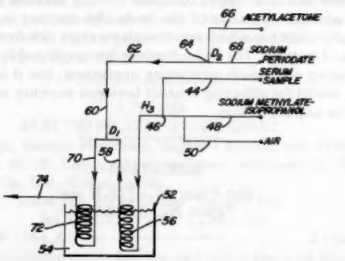
A portable purification device for fluids having a filter for filtering fluid and clarifying same, and a purifying apparatus having a tube, a cylinder and a spiral distributor forming a thin, annular, spiraling flow path for subjecting filtered fluid to germicidal rays to destroy harmful micro-organisms. A pump pumps a fluid through the filter. A battery and an inverter provide alternating current for a radiation lamp which is used as a source of germicidal rays. The pump, filter, battery, inverter, and purifying apparatus are arranged in a common housing to form an integral unit.

3,791,791

METHOD AND APPARATUS FOR DETERMINING TRIGLYCERIDE LEVEL

Bernard G. Finkel, Spring Valley; Arthur L. Levy, Mount Vernon, and Carol Keyloun, Briarcliff Manor, all of N.Y., assignors to Scientific Specialties Ltd., Garden City, N.Y.

Filed Nov. 2, 1971, Ser. No. 194,944
Int. Cl. G01n 33/16
U.S. Cl. 23—230 B 2 Claims



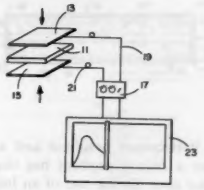
Blood serum is introduced into an extraction tube filled with a premeasured extraction reagent Triglycerides are selectively extracted from the serum by an extraction reagent. The extracted triglycerides are subjected to transesterification to liberate glycerol. The triglycerides are then oxidized and treated with a color-producing reagent. The amount of color is directly proportional to triglyceride concentration which can be measured by a colorimeter.

3,791,792

POLYMER CURE DETERMINATION METHOD

Newton E. Lindsay, Newbury Park, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Mar. 29, 1972, Ser. No. 239,226
Int. Cl. G01n 27/00
U.S. Cl. 23—230 R 8 Claims



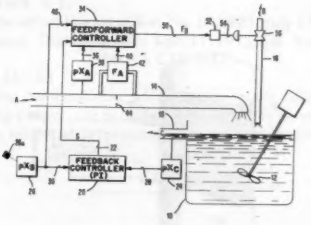
A pair of electrodes formed of dissimilar metals are placed in an uncured resin. As the resin cures, the material produces a dc potential up to several hundred millivolts. The potential can be plotted with time of cure as an indication of the relative rate of chemical activity occurring during the curing period.

3,791,793

ADAPTIVE FEED FORWARD-FEEDBACK CONTROL OF THE CONCENTRATION OF A SELECTED ION OF A SOLUTION

Paul G. Friedmann, Wyndmoor, Pa., and William C. Cohen, Willingboro, N.J., assignors to Leeds & Northrup Company, Philadelphia, Pa.

Filed Jan. 31, 1972, Ser. No. 222,234
Int. Cl. G05b 13/02; G05d 21/02
U.S. Cl. 23—230 A 11 Claims



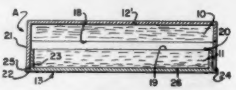
A control system for controlling the flow of reagent into a reactor for the correction of the concentration of a selected ion in the influent to the reactor so as to provide a desired concentration in the effluent stream from the reactor. A feedback controller having proportional and reset responses is provided to control the flow of reagent to maintain the logarithm of the concentration of the ion in the effluent at its set point. The control signal from the feedback controller is multiplied by a feedforward control signal responsive to changes in the logarithm of the ion concentration of the influent, the effluent set point, and influent flow. The resulting product is then summed with the feedforward control signal to provide the final control signal required to control a linear operator for modification of the reagent flow to maintain the logarithm of the ion concentration in the effluent at the set point.

3,791,794

INDICATOR MEANS IN FROZEN STATE UTILIZING pH-SENSITIVE INDICATOR AND SEPARATED ELECTROLYTE

Abraham Emil Tomkin, P.O. Box 7311, Washington, D.C.

Filed Dec. 28, 1971, Ser. No. 212,982
Int. Cl. G01n 21/06, 33/02
U.S. Cl. 23—253 TP 9 Claims



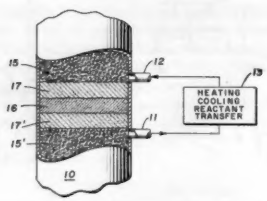
Means whereby it becomes practical and at low cost to determined whether a frozen product has thawed prior to reaching the ultimate user. By the use of an Indicator Means consisting of liquid in a frozen state that forms a layer or layers separating two activating components, a solute electrolyte and a pH-sensitive indicator, that remain inactive as long as the layer or layers are in a frozen state. Upon the melting of the frozen layer or layers, the two activating components become activated in the formed single liquid. The thawing of the frozen product causes the melting of the frozen layer or layers of the Indicator Means thereby triggering an identifying color in the Indicator Means. The identifying color is sharp, distinct and irreversible remaining after the thawed package may be re-frozen providing the ultimate user with a check for pre-thawing since the Indicator Means could be permanently attached to or visibly inserted into each individual package or a number of the indicators could be placed in a carton containing a plurality of frozen packages before the carton is sealed.

3,791,795

INTERBED SEAL FOR MULTIBED REACTORS

Bingham Y. K. Pan; John R. Garton, and Robert V. Parker, all of Texas City, Tex., assignors to Monsanto Company, Saint Louis, Mo.

Filed Nov. 19, 1971, Ser. No. 200,512
Int. Cl. B01j 9/04
U.S. Cl. 23—288 R 12 Claims



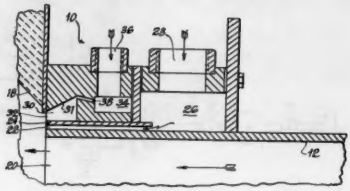
An improved interbed seal for fixed multibed vapor phase catalytic reactors which provides minimum leakage between beds operated under different conditions or with different reactant concentrations. The improved seal consists in a floating seal of a plurality of layers of different sizes of finely divided inert material of increasing size from the center of the seal to the adjacent catalyst beds. The improved seal offers efficient sealing, economy of cost and ease of charge and discharge together with the plurality of catalyst beds for regeneration or recharging fresh catalysts. The preferred finely divided inert material is well-sieved sand of a plurality of different size ranges from smaller than 100 mesh to one-eighth inch.

3,791,796

ANTI-POLLUTION APPARATUS

Slade B. Gamble, Park Ridge, and Richard A. Kelly, Prospect Heights, both of Ill., assignors to Flinn & Dreffein Engineering Co., Northbrook, Ill.

Filed Nov. 24, 1971, Ser. No. 201,885
Int. Cl. F23c 9/04
U.S. Cl. 23—277 C 8 Claims



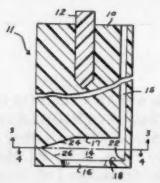
Apparatus for the generation of free radicals and admixture thereof with combustible pollutants for substantially complete elimination of such pollutants by oxidation or combustion.

3,791,797

METHOD FOR PURIFYING MERCURY

Vann Yuen, 2809 Land Park Dr., Sacramento, Calif.

Division of Ser. No. 869,665, Oct. 27, 1969. This application Dec. 20, 1971, Ser. No. 210,277
Int. Cl. B01d 11/04; C01g 13/00
U.S. Cl. 23—312 R 2 Claims



An apparatus for atomizing liquid materials comprises a solid cylindrical body having a rotation means attached to one end and a chamber formed in the other end thereof. Passageways extending through the cylindrical body to the chamber are so arranged that their vertical axes are parallel to and adjacent the sides of the body. An opening is provided into the chamber which has complementary ribs formed in its top and bottom. The apparatus can be employed in a variety of mixing and liquid contacting operations, but it is particularly useful for effecting contact between mercury and agents used in its purification.

ERRATUM

For Class 23—230 B see:
Patent No. 3,792,044

3,791,798

METAL BONDING WITH SINTERING

John F. Joyce, and Hoy O. McIntire, both of Columbus, Ohio, assignors to National Standard Company, Niles, Mich.

Continuation-in-part of Ser. No. 817,304, April 18, 1969, abandoned. This application July 24, 1972, Ser. No. 274,433
Int. Cl. B22f 7/02, 3/00
U.S. Cl. 29—182.2 24 Claims

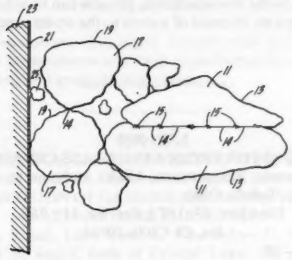
Heat bonding of a first metal component with a second metal component in which the holding is affected to the metal

components being subjected to reduction and sintering in a favorable environment and in which the second metal component consisting of a reducible metal compound has contraction characteristics during reduction and sintering greater than that of the first metal component to effect bonding of two components.

3,791,799
EXTRUSION DIE
Friedrich Franz Xaver Heitzinger, Lechaschau, Austria, assignor to Schwarzkopf Development Corporation, New York, N.Y.
Filed Jan. 29, 1971, Ser. No. 111,136
Claims priority, application Austria, Feb. 2, 1970, 906/70
Int. Cl. B22f 5/00
U.S. Cl. 29—182.5 5 Claims

This invention relates to extrusion dies useful for processing both non-ferrous metals and alloy steels, the dies being made of a predominant amount of molybdenum or tungsten, the remainder being zirconia.

3,791,800
POWDER METALLURGY ALUMINUM PARTS
Sherwood W. McGee, Lisle, Ill., assignor to Amsted Industries, Inc., Chicago, Ill.
Filed Feb. 3, 1971, Ser. No. 112,242
Int. Cl. B22f 3/00, 7/00
U.S. Cl. 29—182.5 6 Claims

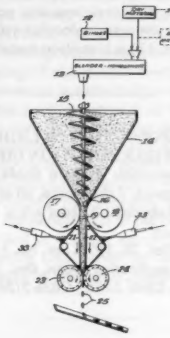


A powder metallurgy aluminum article and a method of producing it in which a lubricant is mixed with an aluminum powder of selected particle shape and size and the mixture is cold compacted to a desired density. The compacted mixture is then sintered in air or a protective atmosphere. The sintered article may then be coined or sized.

3,791,801
ELECTROPLATED STEEL SHEET
Keiji Ariga; Satoshi Morishita; Katsumi Kanda, and Takashi Mizobe, all of Yamaguchi-Ken, Japan, assignors to Toyo Kohan Co., Ltd., Tokyo, Japan
Filed July 23, 1971, Ser. No. 165,751
Int. Cl. C23b 11/00; C23d 5/00
U.S. Cl. 29—196.5 2 Claims

An electroplated steel plate product with a zinc-rich deposit on the steel surface, said deposit comprising an oxide of molybdenum and tungsten (including hydrated oxides), and/or the total amount in the oxide being about 0.05 to about 2 weight percent of the deposit. In addition, the deposit may further include at least one additional material selected from the group consisting of iron, nickel, cobalt, tin and lead, and compound of said metal, the total metal content of the said additional material being about 0.5 to about 15 weight percent of the deposit.

3,791,802
BRIQUETTING APPARATUS
Michael O. Holowaty, Crown Point, Ind., assignor to Inland Steel Company, Chicago, Ill.
Filed Mar. 27, 1972, Ser. No. 238,380
Int. Cl. B30b 11/00; C10l 5/22
U.S. Cl. 44—13 17 Claims



Material to be briquetted is first fed through precompacting rolls to form a precompacted strip of material guided by a pair of endless belts to the nip of briquetting rolls mating to form a line of briquetting pockets. Resulting briquettes have uniform density regardless of the pocket in which they were formed.

3,791,803
ORGANIC COMPOSITIONS CONTAINING N-ACYL BENZOTRIAZOLES
Harry J. Andress, Jr., Pitman, and Alfred B. Piotrowski, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 163,093, July 15, 1971, abandoned. This application Apr. 17, 1972, Ser. No. 244,915
Int. Cl. C10l 1/22
U.S. Cl. 44—63 16 Claims

Organic compositions, which are normally susceptible of corroding copper, are provided, containing, in an amount sufficient to inhibit such corrosion an N-acyl benzotriazole.

3,791,804
FUEL AND LUBRICATING OIL ADDITIVES TRANSITION METAL COMPLEXES
William T. Brannen, West Lake, Ohio, and Roger W. Watson, Highland, Ill., assignors to Standard Oil Company, Chicago, Ill.
Filed Oct. 10, 1969, Ser. No. 865,496
Int. Cl. C10l 1/24
U.S. Cl. 44—68 1 Claim

The disclosure describes the reaction product produced by the reaction of about equal molar portions of (1) an alkyl benzene sulfonic acid, an alkyl sulfonic acid, an alkyl phosphorus acid or an alkyl carboxylic acid having an average molecular weight between about 200 and about 1600 and (2) a transition metal complexed with a polyamine.

3,791,805
TRANSITION METAL COMPLEXES AS FUEL AND MOTOR OIL ADDITIVES

William T. Brannen, West Lake, Ohio, and Roger W. Watson, Highland, Ind., assignors to Standard Oil Company, Chicago, Ill.

Filed Oct. 10, 1969, Ser. No. 865,498
Int. Cl. C10l *1/24*
U.S. Cl. 44—68 **1 Claim**

The disclosure describes the reaction product produced by the reaction of about equal molar portions of (1) a polymeric succinic anhydride, polymeric succinic acid or polymer succinimide having an average molecular weight between about 250 and 2,500, and (2) a transition metal complexed with a polyamine.

3,791,806
CONTINUOUS PRODUCTION OF LIGHT-CONDUCTING GLASS FIBERS WITH ION DIFFUSION

Ken Koizumi, Kawanishi; Yoshiro Ikeda, Nishinomiya, and Mitsugi Yoshiyagawa, Takarazuka, all of Japan, assignors to Nippon Selfoc Kabushiki Kaisha a/k/a Nippon Selfoc Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1970, Ser. No. 101,573
Claims priority, application Japan, Dec. 30, 1969, 44-424
Int. Cl. C03c *25/02*; **C03b** *5/26, 15/00*
U.S. Cl. 65—3 **5 Claims**

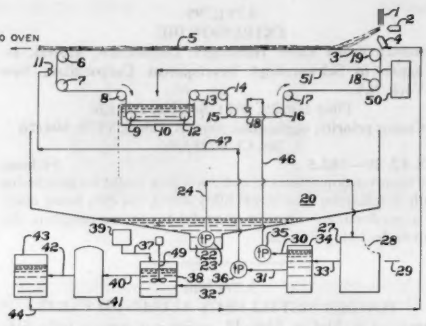
In a process for continuously producing a light conducting glass fiber wherein the refractive index in a plane perpendicular to the optical axis of the glass fiber is so distributed that it continuously decreases outward from a certain value at the center toward the peripheral portion, a first kind of glass containing ions having a greater degree of contribution to the refractive index is drawn, in molten state from a central orifice to form the core portion of the glass fiber, and another kind of melted glass containing ions having less contribution to the refractive index is drawn from a second orifice to form an outer coating layer of the glass fiber, the tip of the first central orifice being located at a retracted position compared to that of the second orifice with respect to the drawn direction of the melted glasses, whereby thermal mutual diffusion of these ions is caused to occur through a boundary surface between two kinds of glasses located mainly in the distance portion between the tips.

3,791,807
WASTE WATER RECLAMATION IN FIBER GLASS OPERATION

James E. Etzel, Lafayette; Clarence H. Helbing, Shelbyville, and Carl A. Justus, Indianapolis, all of Ind., assignors to Certain-teed Products Corporation, Valley Forge, Pa.

Filed May 2, 1972, Ser. No. 249,582
Int. Cl. C03c *25/02*
U.S. Cl. 65—3 **5 Claims**

A process is described for the utilization of waste waters typically encountered in the manufacture of fiber glass in which the waste water is treated both mechanically and chemically to remove solid materials contained in the waste water such as fiber glass, dust and other like materials. The waters are also chemically treated with high molecular weight cationic polymers to reduce substantially the phenolic resin



content of the waters. Recirculation of various water streams for utilization in the fiber glass manufacturing process including utilization of treated waters in the manufacture of binder solutions is also described. The process is such that waste waters used in the manufacturing process can be totally reused thus requiring no disposal of waters to the environment.

3,791,808
METHOD FOR PRODUCING GLASS CERAMICS

Ian M. Thomas, Temperance, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 23, 1971, Ser. No. 211,760
Int. Cl. C03b *29/00*
U.S. Cl. 65—30 **17 Claims**

There is disclosed a process for the preparation of glass ceramics from a thermally crytallizable oxide product which is formed by hydrolysis and condensation reactions and wherein the oxide product is produced and is converted to a glass ceramic at temperatures below the normal liquidus or normal melting temperature of an oxide composition corresponding to the oxide composition of the oxide product.

3,791,809
METHOD OF STRENGTHENING GLASS ARTICLES USING POWDERED SALTS FOR ION EXCHANGE

Raymond Thomas Lau, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 12, 1973, Ser. No. 323,172
Int. Cl. C03c *17/00, 21/00*
U.S. Cl. 65—30 **25 Claims**

Methods for strengthening glass articles such as glass containers are disclosed using powdered salts as the ion exchange medium. In one embodiment, beer bottles made of a conventional flint container glass are sprayed with a powdered ion exchange medium comprising potassium nitrate and tripotassium phosphate. The hot, newly-formed bottles can be advantageously run through the normal annealing treatment in a large volume production line to provide strengthened bottles.

3,791,810

PROCESS FOR PREPARING LIGHTWEIGHT FERTILIZER CONTAINING AMMONIUM POLYPHOSPHATE

Clinton Allen Hollingsworth, Lakeland, and Louis John Lamb, Lutz, both of Fla., assignors to Borden, Inc., New York, N.Y.

Continuation of Ser. No. 83,234, Oct. 22, 1970, abandoned.
This application Aug. 30, 1972, Ser. No. 284,770
Int. Cl. C05b 7/00
U.S. Cl. 71—34 1 Claim

A process for preparing a lightweight fertilizer containing ammonium polyphosphate and optionally other plant nutrients by heating a mixture of ammonium polyphosphate with a leavening and hardening agent selected from calcium carbonate, calcium oxide, magnesium carbonate, sodium carbonate, sodium bicarbonate, dolomite or manganese carbonate at a temperature of about 250°F to 375°F for a time sufficient to foam the mixture and subsequently cooling the foamed mixture. Preferably, various plant nutrients such as sources for potash are added to the mixture prior to foaming.

3,791,811

STORABLE HIGHLY CONCENTRATED PESTICIDES AND PROCESS FOR THEIR MANUFACTURE

Heinz French; Konrad Albrecht, both of Frankfurt am Main, and Eugen Schafer, Hofheim, Taunus, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius and Bruning, Frankfurt Main, Germany

Continuation of Ser. No. 746,507, July 22, 1968
Filed Jan. 14, 1970, Ser. No. 4,174
Claims priority, application Germany, July 28, 1967, 53083
Int. Cl. A01n 9/20
U.S. Cl. 71—120 12 Claims

The invention provides highly concentrated preparations of pesticidal formulations and their manufacture by means of a wet-grinding and spray-drying process.

3,791,812

PROCESS FOR THE RECOVERY OF NON-FERROUS METAL VALUES FROM SULFIDE ORES AND THE REDUCTION OF GASEOUS EMISSIONS TO THE ATMOSPHERE THEREFROM

Robert L. Frank, Lake Geneva, Wis.; Sidney G. Martin, and Clayton S. Smith, both of Crystal Lake, Ill., assignors to Morton-Norwich Products, Inc., Chicago, Ill.

Filed Dec. 20, 1971, Ser. No. 210,081
Int. Cl. C22b 3/00; C01g 3/10; C01c 3/04
U.S. Cl. 75—9 9 Claims

A process for roasting an admixture of an inorganic chloride and a sulfide ore for subsequent extraction of substantially all of the copper, nickel, cobalt and manganese values of the ore as water soluble salts and for reducing the emission to the atmosphere of large quantities of sulfur dioxide and chlorine formed during said process without the necessity of using chemical absorbing solutions. The process comprises mixing the ore with an inorganic chloride such as sodium chloride, lithium chloride, potassium chloride, calcium chloride and magnesium chloride, providing the mixture in a gas permeable state to a first stage heating or roasting zone while maintaining therein from about 80 to about 140 percent of the stoichiometric quantity of air therein, conducting exhaust gases from the first stage heating zone to a second stage heating or roasting zone which contains roasted mixture from the first stage heating zone, replenishing the first stage roasting zone with fresh inorganic chloride-ore mixture, trapping exhaust gases from the second stage heating zone in water and leaching the roasted mixture from said second stage heating zone with water to extract substantially all of said metal values as water soluble salts. The process reduces the emission to the atmosphere of sulfur dioxide and of chlorine by at least about 85 percent, and upwards of 90 percent in preferred embodiments.

3,791,813

METHOD FOR INJECTING A GASEOUS REACTING AGENT INTO A BATH OF MOLTEN METAL

Sundaresan Ramachandran, Natrona Heights, and Basil U. N. Igwe, New Kensington, both of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed July 9, 1971, Ser. No. 161,040
Int. Cl. C21c 7/00, 5/30
U.S. Cl. 75—59 7 Claims

Method for injecting a gaseous reaction agent into a bath of molten metal by the use of a submerged nozzle to achieve the generation of a mass of very fine bubbles throughout a substantial portion of the bath. The bubbles mix and stir the bath to effect chemical homogeneity with a minimum amount of splashing and slopping of the molten metal and persist for a time sufficient to promote substantially complete reaction of the gas phase with the environmental fluid. By selecting a bubble diameter from a consideration of the desired gas flow rate and appropriate Reynolds number, the gas issuing into the molten bath will disperse into small bubbles of essentially constant diameter to maximize the gas-liquid interfacial area. Additionally, by controlling the pressure of the gas forced through the nozzle, the penetration of the fine bubbles into the bath can be controlled to achieve maximum stirring and optimum bubble retention time within the bath without damaging the refractory lining of the vessel containing the bath.

3,791,814

PROCESS FOR OXYGEN REFINING OF PIG IRON

Alfred Decker, Embourg, Belgium, assignor to Centre de Recherches Metallurgiques, Brussels, Belgium

Filed Feb. 21, 1973, Ser. No. 334,340
Claims priority, application Belgium, Feb. 22, 1972, 779689; Nov. 29, 1972, 792087; Luxembourg, Apr. 7, 1972, 65126
Int. Cl. C21c 5/30
U.S. Cl. 75—60 7 Claims

In the refining of pig iron in a convertor vessel in which oxygen is introduced into the melt by means of one or more tuyeres located in the sidewall of the convertor. Excessive wear of the convertor lining opposite the tuyere is avoided by blowing in a protective fluid which shields the lining from the erosive action of the refining gas and excessive slopping due to oscillations caused by introduction of the refining gas are countered by introduction of fluid opposing the movement of the bath, and pulsed to be out of phase with the bath movement.

3,791,815

PROCESS FOR LANTHANIDE AND ACTINIDE METALS ORE REDUCTION

Paul Franklin Taylor, P.O. Box 468, Crossville, Tenn.

Filed Dec. 13, 1972, Ser. No. 314,809
Int. Cl. C22c 59/00, 61/04
U.S. Cl. 75—84.1 R 3 Claims

The Lanthanide and Actinide series of metals are found mainly in the three ores Monazite, Carnotite, and Uraninite or Pitchblende. In winning these metals from the ores usually the oxides are separated either seperately or in groups first, then the oxides are reduced either separately or in groups, thereby providing individual metals, or an alloy known as a commercially designated Misch metal. Such separations and reductions apply to only the ores as found natural and does not include the manmade nuclear transformation elements of the series. The separations and reductions both from the ores, the oxides, and the Misch metal are quite complicated, cumbersome, costly, and at times are inefficient. By application of the instant process such ores and oxides may be reduced in either of those forms in a more simple manner to either the individual metals or the alloy. The alloy metal may then be sub-

sequently separated into individual metals at great savings in operations and cost in comparison to that which is known. The ores or oxides are subjected to a certain liquid formula solution, such material being finely pulverized, by mixing together within a suitable container, followed by additions of pulverized limestone and stirred while the reaction goes to completion. The liquid formula is comprised of phosphoric acid, zinc oxide, and an alkylphenol polyglycol ether type sulfated surfactant. The mixture is heated within the container by an endothermic heat source until the ore has been digested by the liquid formula solution with the consequent release of gases and expanded in volume to a dry, spongelike state. In this condition the material is considered as being "fixed" for smelting. Upon smelting the material releases the metal which forms into ingot-like masses at the bottom of the furnace as reduced and smelted metal. The combination of reduction ingredients are effective, therefore, in liberating the metals from chemically bound oxygen and other impurities upon heating the mixture and then smelting the residue.

3,791,816

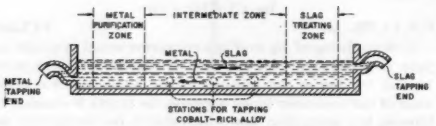
PRODUCTION OF NICKEL FROM NICKEL-BEARING MATERIALS

Robert D. Israel, Oakland, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Continuation-in-part of Ser. No. 22,755, March 26, 1970, abandoned. This application Mar. 30, 1972, Ser. No. 239,454

Int. Cl. C22b *23/00*

U.S. Cl. 75—82 **4 Claims**



A process for producing nickel of high purity and with high recovery from nickel-bearing materials containing nickel and less noble metals including cobalt and iron, such as ores and alloys. A molten slag phase and molten metal phase is provided in a furnace having an elongated flow path in which the nickel of high purity is removed at a point near one end of the furnace while molten slag highly impoverished with respect to nickel oxide is removed at a point near the other end. A metal purification zone and a slag treating zone are established in the vicinity of the molten metal removal point and the molten slag removal point, respectively.

An intermediate zone is located between the metal purification zone and the slag treating zone, and a countercurrent movement between the slag and metal phases is induced, the said slag phase flows from the metal purification zone through the intermediate zone to the slag treating zone while the metal phase flows from the slag treating zone through the intermediate zone to the metal purification zone. Oxidation of the metal phase in the metal purification zone provides the nickel in high purity, while treatment of the slag in the slag treating zone with a reducing agent effects a high recovery. Interphase contact and intraphase mixing between the slag and metal phases is promoted during their flows. At least periodically, a portion of the metal present in the metal phase in the intermediate zone, which is rich in cobalt, is removed.

3,791,817

RECOVERY OF COOPER FROM COPPER SULFIDE CONTAINING CONCENTRATES

Edward Peter Cadwell, Tucson, Ariz., assignor to Treadwell Corporation, New York, N.Y.

Filed Feb. 10, 1972, Ser. No. 225,095

Int. Cl. C22b *3/00*

U.S. Cl. 75—106 **8 Claims**

Low grade copper sulfide containing concentrates and ores are treated with an alkaline cyanide, such as calcium cyanide and excess lime or sodium cyanide and excess sodium alkali. This dissolves the copper sulfide as a complex cyanide, the liquor is separated from the denuded solids, and the solids washed with water to remove adhering soluble copper cyanide complex. The two liquors are then treated with acid or metal salts to desulfurize them, transforming the sulfur content either to hydrogen sulfide or a metal sulfide and precipitating the copper as acid insoluble cuprous cyanide. The cuprous cyanide is separated and copper recovered therefrom by known methods, such as reduction with hot hydrogen. HCN evolved if the desulfurization is by acid and/or from the hydrogen-HCN produced by the hot hydrogen reduction is transformed into alkaline cyanide and reused. A reducing agent, such as sulfur dioxide, is present during the cuprous cyanide precipitation in sufficient amount to maintain copper in the cuprous state.

3,791,818

STEEL ALLOY

Thomas Watmough, Dolton, and Robert P. O'Shea, Lombard, both of Ill., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 14, 1972, Ser. No. 280,282

Int. Cl. C22c *39/26*; **F42b** *13/48*

U.S. Cl. 75—126 E **3 Claims**

A low alloy steel which utilizes boron as an essential alloying ingredient. The boron controls and manipulates the fragment mass distribution characteristics of alloy steels used in fabricating explosive warheads.

3,791,819

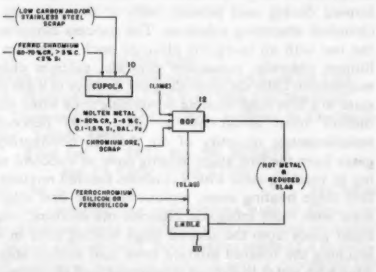
PRODUCTION OF STAINLESS STEELS

Russell H. Loutzenhiser, Detroit, Mich.; Egil Aukrust, Bethel Park, and Harry W. Meyer, Mount Lebanon, both of Pa., assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 464,900, June 18, 1965, abandoned. This application Nov. 12, 1968, Ser. No. 775,041

Int. Cl. C22c *39/14*

U.S. Cl. 75—130.5 **1 Claim**



Disclosed is a method of making stainless steel that has remarkable advantages over the electric-furnace practices now used. The method uses an oxygen furnace, yielding large

savings in the time, capital investment, and labor required to produce a given quantity of steel. The practical difficulties that attend the use of an oxygen vessel to make stainless steel are overcome, principally by using a slag of high basicity ratio (3.5 minimum) operating the furnace so that the melt stays below 3100° F during most of the refining, and reducing the slag in a separate vessel, the contents of which are returned to the oxygen vessel.

3,791,820

FLUXLESS ALUMINUM BRAZING

William J. Werner, Clinton, Tenn., assignor to The Unites States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Division of Ser. No. 77,762, Oct. 2, 1970. This application June 23, 1972, Ser. No. 266,372

Int. Cl. C22c *21/00*

U.S. Cl. 75—140 **1 Claim**

This invention relates to a fluxless brazing alloy for use in forming brazed composites made from members of aluminum and its alloys, said brazing alloy consisting of, in weight percent, 35–55 percent aluminum, 10–20 percent silicon, 25–60 percent germanium; 65–88 percent aluminum, 2–20 percent silicon, 2–18 percent indium; 65–80 percent aluminum, 15–25 percent silicon, 5–15 percent yttrium.

3,791,821

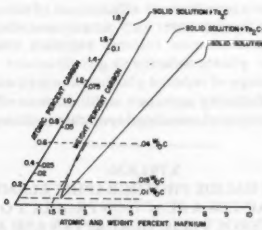
TANTALUM BASE ALLOYS

Raymond W. Buckman, Jr., Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 598,941, Dec. 5, 1966, abandoned, which is a continuation-in-part of Ser. No. 454,650, May 10, 1965, abandoned. This application Oct. 30, 1968, Ser. No. 771,714

Int. Cl. C22c *27/00*; **C22f** *1/18*

U.S. Cl. 75—174 **9 Claims**



This invention is directed to tantalum-base alloys having superior elevated temperature strength and high resistance to creep deformation at elevated temperature in a high vacuum or space environment. The alloys comprise from 4 to 8.5 percent tungsten, up to 3 percent of at least one of the group consisting of molybdenum and rhenium, up to 1.5 percent of at least one of the group consisting of zirconium and hafnium, up to 0.04 percent of at least one of the group consisting of carbon and nitrogen and the balance essentially tantalum.

3,791,822

REMOVAL OF BACKGROUND FROM AN IMAGED MIGRATION LAYER

William L. Goffe, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 784,164, Dec. 16, 1968, Pat. No. 3,741,757, which is a continuation-in-part of Ser. Nos. 725,676, May 1, 1968, abandoned, and Ser. No. 460,377, June 1, 1965, Pat. No. 3,520,681, and Ser. No. 483,675, Aug. 30, 1965, Pat. No. 3,656,990, said Ser. No. 725,676, is a continuation-in-part of Ser. No. 460,377, , and Ser. No. 483,675, , each is a continuation-in-part of Ser. No. 403,002, Oct. 12, 1964, abandoned. This application Nov. 17, 1972, Ser. No. 307,675

Int. Cl. G03g *13/14*, *13/22*

U.S. Cl. 96—1 PS **12 Claims**

Providing an imaged member comprising a layer of softenable material and migration material selectively distributed in depth in said softenable material in first image configuration and comprising in addition to said first image pattern of migration material a background of substantial amounts of migration material in said softenable material but spaced apart, in depth, from said first image pattern; and removing said background.

3,791,823

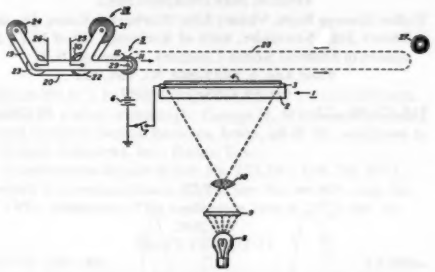
PHOTOELECTROPHORETIC IMAGING TRANSFER METHOD

Leonard M. Carreira, Penfield, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Continuation of Ser. No. 808,921, March 20, 1969, abandoned, which is a continuation of Ser. Nos. 459,860, May 28, 1965, abandoned, and Ser. No. 677,706, Oct. 24, 1966, abandoned, and Ser. No. 677,707, Oct. 24, 1967, abandoned. This application Feb. 18, 1970, Ser. No. 12,366

Int. Cl. G03g *13/00*, *13/14*

U.S. Cl. 96—1.4 **6 Claims**



An electrophoretic imaging system is described in which a particulate image is transferred to a receiving sheet having a water tackifiable surface. The surface is moistened, pressed against the image and dried. In a preferred embodiment, the water tackifiable material is converted to a water insoluble form by heat after transfer of the image.

3,791,824

CONJUGATED POLYMERS IN ELECTROPHOTOGRAPHY

Wolfgang G. Bauer, Korntal, Germany, and Ulrich T. Mueller-Westerhoff, Monte Sereno, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 20, 1973, Ser. No. 333,829

Int. Cl. G03g *5/04*, *7/00*

U.S. Cl. 96—1.5 **4 Claims**

Poly-2,9-methylenefluorene, fully conjugated via 9-methylenefluorene repeating units, has been found to be a useful photoconductor in electrophotographic processes.

3,791,825

PHOTOCONDUCTOR IN A COPOLYMER BINDER OF VINYL ACETATE, VINYL LAURATE AND AN $\alpha\beta$-ETHYLENICALLY UNSATURATED ACID

Karel Eugeen Verhille, Hoboken, and Luciaan Frans Voet, Katelijne-Waver, both of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed June 6, 1972, Ser. No. 260,202
Claims priority, application Belgium, June 8, 1971, 19477
Int. Cl. G03g 5/04, 5/06
U.S. Cl. 96—1.5 8 Claims

A photoconductive recording layer for use in electrophotography comprises a photoconductive pigment dispersed in an electrically insulating binder therefor consisting of a copolymer of 83 to 95.5 percent by weight of vinyl acetate, 4 to 15 percent by weight of vinyl laurate and 0.5 to 2 percent by weight of an α, β-ethylenically unsaturated acid, preferably crotonic acid.

3,791,826

ELECTROPHOTOGRAPHIC PLATE

Albert J. Cherry, Morgan Hill; Robert R. Neiman; Meredith D. Shattuck, both of San Jose, and William J. Weiche, Los Gatos, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 33,531, April 30, 1970, abandoned. This application Jan. 24, 1972, Ser. No. 220,471
Int. Cl. G03g 5/04, 5/08
U.S. Cl. 96—1.5 1 Claim

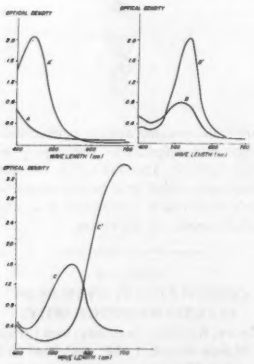
An electrophotographic plate comprising in successive layers: (a) a conductive substrate, (b) a barrier layer, (3) an inorganic charge generating layer at least 0.15 microns thick, and (d) an organic charge transport layer from 3 to 20 microns thick comprising at least about 20 percent by weight of 2, 4, 7-trinitro-9-fluorenone.

3,791,827

'ONIUM INDOPHENOXIDES

Walter Monroe Bush, Victor; John Warburton Gates, Jr., and Robert John Newmiller, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 6, 1971, Ser. No. 169,706
Int. Cl. G03c 5/50, 7/32
U.S. Cl. 96—22 30 Claims



'Onium indophenoxide compounds are disclosed with processes for preparation of 'onium indophenoxides. In one embodiment, improved photographic processes are described for forming indophenoxide image dyes in a photographic element. Another embodiment relates to improved photographic elements containing 'onium indophenoxide image dyes.

3,791,828

DEVELOPER SOLUTION FOR DEVELOPING PRESENSITISED PHOTOLITHOGRAPHIC PRINTING PLATES

Brian Joseph Moore, and Leonard James Watkinson, both of Yorkshire, England, assignors to W. H. Howson Limited, Yorkshire, England

Division of Ser. No. 727,656, May 8, 1968. This application Aug. 23, 1972, Ser. No. 282,935
Claims priority, application Great Britain, May 18, 1967, 23249/67
Int. Cl. G03f 7/02
U.S. Cl. 96—33 4 Claims

This disclosure relates to developer solutions suitable for developing exposed presensitised photolithographic printing plates, which solutions comprise a solvent for the areas of presensitised layer to be removed from the printing plate and a surface active agent, the volumetric ration of solvent to surface active agent being considerably higher than conventionally used, whereby the efficacy of the developer solution is considerable enhanced.

3,791,829

PHYSICALLY DEVELOPABLE COPY MEDIUM WITH PHOTOCONDUCTORS AND COMPLEXING AGENT

Phillip G. Creter, Sudbury, Mass., assignor to Itek Corporation, Lexingon, Mass.

Filed July 3, 1972, Ser. No. 268,240
Int. Cl. G03c 5/24, 5/30, 1/00, 1/06
U.S. Cl. 96—48 PD 46 Claims

This invention relates to a copy medium capable of transmitting ultraviolet radiation comprising a photosensitive layer having a photoconductive material such as titanium dioxide and certain complexing agents incorporated in a binder. The photosensitive material, upon exposure to activating radiation in an image pattern, becomes reversibly activated in the image pattern. The reversibly activated portions are then capable of causing a chemical reaction which permits development and formation of an irreversible image by physical development such as by contact with a chemical redox system, an aqueous solution of silver nitrate and a suitable photographic reducing agent being an example thereof. The copy medium of the invention is characterized by having a photosensitive layer of reduced photoconductor coat weight without the expected decrease in sensitometric characteristics such as reduced image optical density. The reduced coat weight of photoconductor is made possible by the addition of the complexing agent to the photosensitive material. A copy medium having a photosensitive layer of reduced photoconductor coat weight is an advantage as it permits more efficient use of the copy medium for various applications such as use as a diazo master wherein the medium must transmit radiation which is absorbed by the photoconductor e.g., ultraviolet radiation. Another advantage of reduced photoconductor coat weight is reduced manufacturing costs as a result of more efficient use of photoconductor and associated spectral sensitizing dyes.

3,791,830

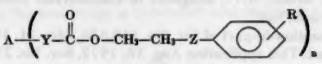
SILVER HALIDE PHOTOGRAPHIC ELEMENT CONTAINING A REACTION PRODUCT OF A HETEROCYCLIC MERCAPTAN AND A CHLOROFORMIC ACID ESTER AS ANTIFOG AGENT

Werner Abele, Friedrich-List-Strasse, Germany, assignor to E. J. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of Ser. No. 207,593, Dec. 13, 1971, abandoned. This application May 22, 1973, Ser. No. 362,737
Claims priority, application Germany, Dec. 16, 1970, 2061972
Int. Cl. G03c 1/34, 1/48
U.S. Cl. 96—76 R 8 Claims

Photographic material is stabilized against over-development wherein the emulsion layer or an auxiliary layer in con-

tact with emulsion layer contains an antifogging agent of the formula



where A is a nitrogen-containing heterocyclic radical having 5 or 6 atoms in the heterocyclic ring; Y is S for $n=1$ and S or S and NH - for $n=2$; R is any desired substituent such as alkyl, halogen or hydroxyalkyl; Z is S or SO_2; and n is 1 or 2.

3,791,831

PHOTOGRAPHIC MATERIALS WITH ANTISTATIC LAYERS

Wulf von Bonin, Leverkusen; Julius Geiger, Odenthal-Gloebusch; Gunter Meinhardt; Karl-Otto Meyer, both of Leverkusen; Werner Wagenknecht, Cologne, and Wolfgang Himmelmann, Opladen, all of Germany, assignors to Agfa-Sevaert Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 3, 1971, Ser. No. 120,761

Claims priority, application Germany, Mar. 12, 1970, 2011649; Jan. 23, 1971, 2103197

Int. Cl. G03c *1/82*

U.S. Cl. 96—87 A **9 Claims**

The antistatic properties of photographic materials can be improved by applying an antistatic layer containing as antistatic agents a mixture of polymers, or a graft polymer, containing sulfo as well as carboxyl groups.

3,791,832

DIAZOTYPE PHOTOPRINTING MATERIAL

Shoji Maruyama, Sagamihara; Tadashi Saito, Yokohama; Shigfaki Yoshida, Yokohama, and Masaru Shimada, Yokohama, all of Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

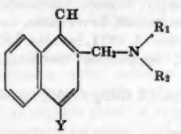
Continuation-in-part of Ser. No. 821,968, May 15, 1969, Pat. No. 3,699,000. This application Mar. 10, 1972, Ser. No. 233,756

Claims priority, application Great Britain, Apr. 22, 1969, 20378/69; Germany, May 14, 1969, 1924685; Netherlands, May 12, 1969, 6907274

Int. Cl. G03c *1/58*

U.S. Cl. 96—91 R **5 Claims**

This invention describes diazotype photoprinting material containing as a coupling component a compound of the formula:



wherein R_1 and R_2 are hydrogen, alkyl, phenyl, or taken together form a heterocyclic ring and Y is an alkyl or alkoxy.

This photoprinting material gives a dense dye-image having high preservability. It could be developed by both dry and wet development methods.

3,791,833

CERAMIC COMPOSITION

Masatoshi Sugiura, 2, Jodoji Minamida-cho, Sakyo-ku, Kyoto; Masaya Hirabayashi, 6, Shironoue, Kotari, Nagaoka-cho, Otokuni-gun, Kyoto, and Yosimasa Goto, c/o Kyoto Ceramic Co., Ltd., 101 Hara-machi, Nishinokyo Nakagyo-ku, Kyoto, all of Japan

Continuation-in-part of Ser. No. 864,178, Oct. 6, 1969, abandoned. This application Jan. 27, 1972, Ser. No. 221,267

Claims priority, application Japan, Oct. 18, 1968, 43-76218

Int. Cl. C04b *33/26*

U.S. Cl. 106—46 **5 Claims**

A colored ceramic body for use in various parts of electronic equipment, comprising at least one of Al_2O_3 and BeO as a basic component, 0.1 to 5 percent by weight CoO and further additive chosen from the group consisting of MnO_2, Cr_2O_3, V_2O_5, Fe_2O_3 and mixtures thereof, the total amount of CoO and further additive being 1.0 to 10 percent by weight. The ceramic body is dark in color and has excellent electrical, mechanical and thermal characteristics, and maintains an acceptably high volume resistivity even after the body has been heated in a reducing atmosphere.

3,791,834

ZIRCON REFRACTORY COMPOSITIONS

Edward L. Manigault, Cincinnnati, Ohio, assignor to The Chas. Taylor & Sons Company, Cincinnati, Ohio

Filed May 31, 1972, Ser. No. 258,459

Int. Cl. C04b *35/16, 35/48*

U.S. Cl. 106—57 **4 Claims**

A new refractory composition comprising from 70.0% to 96.8% zircon, from 3.0% to 29.8% iron-chromite ore and from 0.2% to 5.0% rutile titanium dioxide has been prepared which has a low porosity and high modulus of rupture.

3,791,835

SEMI-SILICA PLASTIC REFRACTORY COMPOSITION

George F. Carini, Pittsburgh; George H. Williams, Cheswick, and Richard Orman Burhans, Irwin, all of Pa., assignors to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 225,287, Feb. 10, 1972, which is a continuation-in-part of Ser. No. 66,627, Aug. 24, 1970, abandoned. This application June 4, 1973, Ser. No. 366,386

Int. Cl. C04b *35/14*

U.S. Cl. 106—68 **5 Claims**

Semi-silica plastic refractory comprising crude flint clay, quartizite, and a plastic bond clay.

3,791,836

LOW DENSITY MOLDING POWDER OF VERMICULITE AND CLAY

Patrick Michael Brown, Baltimore, and Vernon Bruce May, Ellicott City, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Aug. 25, 1972, Ser. No. 283,896

Int. Cl. C04b *31/20, 31/26*

U.S. Cl. 106—71 **9 Claims**

A process for the continuous preparation of a homogeneous lightweight molding powder comprised of clay, vermiculite, water, and, in some cases, an additive for further improving strength, in which the solid components are fed to a liquid-solids blender wherein the water can be added simultaneously.

3,791,837

DEXTRAN AS BONDING AGENT FOR PLASTER OF PARIS BANDAGES

David F. Smith, 120 Grove St., Bay Head, N.J.

Division of Ser. No. 95,365, Dec. 4, 1970, Pat. No. 3,671,280, which is a continuation-in-part of Ser. No. 65,732, Aug. 20, 1970. This application Jan. 21, 1972, Ser. No. 219,887

Int. Cl. C04b *11/16*; A61l *15/07*

U.S. Cl. 106—114 2 Claims

Dextran is disclosed as efficient bonding Agent for plaster of Paris bandages.

3,791,838

VULCANIZATION ACCELERATOR FOR NATURAL AND SYNTHETIC RUBBER

Earl Kaplan, Metuchen, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 119,858, March 1, 1971, which is a continuation of Ser. No. 762,126, Sept. 24, 1968, abandoned. This application Oct. 13, 1972, Ser. No. 297,552

Int. Cl. C08b *25/02*

U.S. Cl. 106—205 12 Claims

A fast wetting, rubber vulcanization accelerator composition is provided which comprises a major amount of the zinc salt of 2-mercaptobenzothiazole and minor but effective amounts of: (a) a salt of a dialkyl (C_5–C_{20}) ester of sulfosuccinic acid, and (b) guar gum or starch. Dispersions of the composition in water are stable, fluid and substantially non-thixotropic such that they are storable and can be easily pumped and blended with a rubber latex.

3,791,839

WAX EMULSIONS FOR CONTROLLING TRANSPIRATION IN PLANTS

Donald R. Cushman, Wenonah; Edward A. Oberright, Woodbury, both of N.J., and Roy T. Edwards, deceased, late of Mullica Hill, N.J. (by Katherine S. Edwards, representative), assignors to Mobil Oil Corporation, New York, N.Y., by said Cushman and Oberright

Continuation-in-part of Ser. No. 60,957, July 2, 1970, which is a division of Ser. No. 639,041, May 17, 1967, abandoned. This application May 25, 1972, Ser. No. 256,997

Int. Cl. C08h *9/06*

U.S. Cl. 106—268 4 Claims

Transpiration in plants, particularly during growth in dry climates, transplantation or shipment, is controlled by application to the plant surface of wax emulsion compositions comprising paraffin wax, petrolatum, emulsifier and water.

3,791,840

TREATMENT OF CARBON FIBERS TO IMPROVE SHEAR STRENGTH IN COMPOSITES

John Baldwin Barr, Strongsville, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Oct. 21, 1970, Ser. No. 82,816

Int. Cl. C09c *1/44*

U.S. Cl. 106—307 51 Claims

The interlaminar shear strength of carbon fiber-plastic composites is improved by treating the fibers, before they are incorporated into the plastic matrix, with an aqueous solution of hypochlorous acid having a pH below 6.

3,791,841

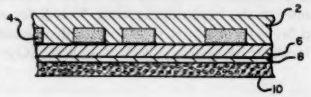
LOW TEMPERATURE DECALCOMANIA

Andrew E. Carmellini, Brookfield, Conn., and Andrew J. Rogers, Bronx, N.Y., assignors to Commercial Decal, Inc., Mt. Vernon, N.Y.

Continuation-in-part of Ser. No. 145,630, May 21, 1971, abandoned. This application Aug. 10, 1972, Ser. No. 279,473

Int. Cl. B41m *3/12*

U.S. Cl. 117—3.4 25 Claims



There is provided herewith a decalcomania which is designed for application to a ware and which becomes adherent to the surface thereof by firing at low temperatures. The decal includes a lacquer layer and an opaque layer, each comprising a thermosetting epoxy resin in a solvent therefor and containing combined therewith a cross-linking agent.

3,791,842

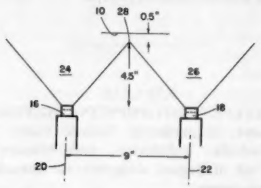
PROCESS OF APPLYING POWDER TO A ROTATING OBJECT

Dennis Neal, Tulsa, Okla., assignor to Midwestern Specialties, Ltd., Tulsa, Okla.

Filed Mar. 31, 1971, Ser. No. 129,869

Int. Cl. B05b *5/2*; B44d *1/94*

U.S. Cl. 117—16 6 Claims



A method of spraying powder from nozzles onto the outer periphery of the pipe while the pipe is rotated about its longitudinal axis. The spray nozzle or nozzles are spaced from the outer periphery of the pipe and at the optimum angle with respect to the transverse or cross-sectional configuration of the pipe for providing the most efficient and complete coating or covering of the object.

3,791,843

THERMOMAGNETIC IMAGING METHOD

Josef Kohlmannsperger, Munich, Germany, assignor to Agfa-Gevaertaktiengesellschaft, Leverkusen, Germany

Filed Nov. 3, 1971, Ser. No. 195,338

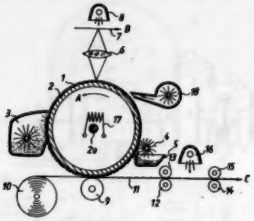
Claims priority, application Germany, Nov. 4, 1970, 2054117

Int. Cl. G03g *17/00*, *19/00*

U.S. Cl. 117—17.5 10 Claims

The magentic image receiving surface of a copying apparatus is provided with a layer of FeRh or an analogous ingredient which is antiferromagnetic above and below its Neel temperature but exhibits a pronounced coercive force at the Neel temperature. The image receiving surface is moved past an exposure station to receive a thermal image of an original. The exposing step may involve heating selected areas of the image receiving surface to Neel temperature in accordance

with the image pattern of the original or heating selected areas of the image receiving surface to above the Neel temperature while the remaining areas remain at Neel temperature. The resulting thermal image is converted with magnetic toner into



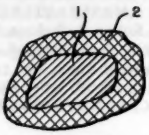
a powder image, either on the image receiving surface or upon transfer onto an auxiliary surface, and the powder image is transferred onto and fused to paper or another transfer material.

3,791,844

PHOSPHORS FOR MULTI-COLOR DISPLAYS

Melvin Tecotzky, Mendham, and James J. Mattis, Long Valley, both of N.J., assignors to U.S. Radium Corporation, Morristown, N.J.

Filed May 2, 1972, Ser. No. 249,559
Int. Cl. C09k *1/00;* **B44d** *5/00;* **H01i** *29/20*
U.S. Cl. 117—33.5 CM **15 Claims**



A phosphor composite consists of particles each having a core of gadolinium, yttrium or lutetium oxide activated with praseodymium, substantially completely surrounded by a shell of the corresponding oxysulfide or oxyfluoride. This phosphor when deposited on the face of a cathode ray tube emits light of distinctly different colors when excited by electron beams projected at substantially different voltages. A method for making the new phosphors is also described.

3,791,845

ELEMENTS CONTAINING BRIGHTENER COMPOSITIONS

Robert J. Tuite, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 863,364, Oct. 2, 1969, Pat. No. 3,684,729.
This application June 9, 1972, Ser. No. 261,181
Int. Cl. G03c *1/92*
U.S. Cl. 117—33.5 T **15 Claims**

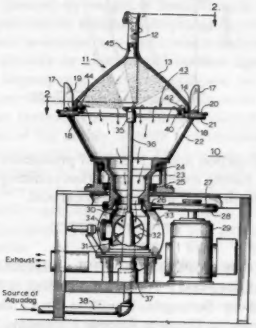
Hydrophilic colloids having intimately dispersed therein an essentially hydrophobic solid solution of an oil-soluble brightening agent in an essentially hydrophobic organic solvent that is rigid (an organic glass) at room temperature, i.e., has a glass transition temperature (Tg) that is above about 25°C. and is a polymer that is an acetal condensation product of polyvinyl alcohol and an aldehyde or ketone having from two to 40 carbon atoms are advantageously used in photographic elements and in image receiving elements for image diffusion transfer because the light-stability of the brightening agents in these dispersions is increased substantially over the light-stability of the same brightening agents in dispersions outside the immediate invention.

3,791,846

METHOD FOR APPLYING AN INTERNAL COATING TO A CATHODE RAY TUBE

Donald E. Nuehring, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Feb. 2, 1972, Ser. No. 222,874
Int. Cl. B05c *7/00;* **C03c** *17/00*
U.S. Cl. 117—38 **3 Claims**



Apparatus for applying Adquadag coating to the funnel of a cathode ray tube envelope comprises means for supporting the envelope with the sealing land exposed, and means for spraying an Aquadag solution upon the wall of the funnel. A deflector is interposed between the spray means and the edge of the funnel to intercept that portion of the spray directed toward that edge while another member is positioned adjacent the inside wall of the funnel to establish an orifice between that member and that portion of the funnel wall normal to the sealing land. The envelope supporting means is rotated, relative to the spray means, to apply a uniform coat of Aquadag upon the funnel while an air pump establishes a pressure differential between the inside of the envelope and the outside to generate a flow of air across the sealing land of tne funnel, up through the orifice and into the funnel to prevent deposit of coating material upon the sealing land. The invention also contemplates a method, utilizing the above described apparatus, for applying an Aquadag material to the funnel section of a cathode ray tube while maintaining the sealing land free of material.

3,791,847

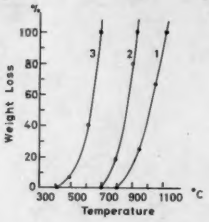
PROCESS FOR THE PRODUCTION OF INCOMBUSTIBLE CARBONACEOUS MATERIAL

Tadashi Araki; Kiro Asano, both of Tokyo, and Jyuniti Koshugi, Urawa, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 26, 1971, Ser. No. 166,118
Claims priority, application Japan, July 27, 1970, 45-65050
Int. Cl. C01b *25/00, 25/08, 31/30;* **C23c** *11/00*
U.S. Cl. 117—46 CG **13 Claims**

A carbonaceous material is obtained by bringing a mixture of one or more substances selected from the group consisting of molecular phosphorus, inorganic phosphorus-containing compounds and organic phosphorus-containing compounds and organic compounds into contact with a substrate heated at a temperature of 600°–1,500°C thereby depositing the resulting carbon formed by pyrolysis on the substrate. Alternatively, an organic phosphorus-containing aromatic compound is brought into contact with a substrate heated at a temperature of 600°–1,500°C thereby depositing the resulting carbon formed by pyrolysis on the substrate. A shaped article coated with said carbonaceous material is obtained by effect-

ing such pyrolysis and deposition on a shaped article made of metal, ceramics glass or carbon. The carbonaceous materials obtained according to this invention are composed of



80–99.9% of carbon and 0.1–20% of phosphorus and are imcombustible having excellent oxidation-resisting properties in addition to the intrinsic properties of carbon.

3,791,848

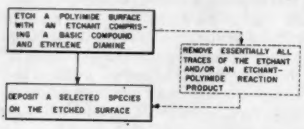
METHOD OF IMPROVING THE ADHERENCE OF A METAL DEPOSIT TO A POLYIMIDE SURFACE

Michael Anthony DeAngelo, Hamilton Twp., Mercer County, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 152,792, June 14, 1971, abandoned. This application May 19, 1972, Ser. No. 255,124

Int. Cl. B44d *1/092;* **C23c** *3/02*

U.S. Cl. 117—47 A **6 Claims**


ETCH A POLYIMIDE SURFACE WITH AN ETCHANT COMPRISING A BASIC COMPOUND AND ETHYLENE DIAMINE
REMOVE ESSENTIALLY ALL TRACES OF THE ETCHANT AND/OR AN ETCHANT-POLYIMIDE REACTION PRODUCT
DEPOSIT A SELECTED SPECIES ON THE ETCHED SURFACE

An etching composition and a method utilizing such a composition for etching a surface of a polyimide is disclosed. The method comprises exposing the polyimide surface to an etching composition comprising an aqueous solution of a basic compound and ethylene diamine. The ethylene diamine synergistically increases the etching rate of the polyimide. When the ethylene diamine is present in an amount in excess of its degree of solubility the etching of the polyimide results in a frosted or matte finish thereof.

3,791,849

PROCESS FOR THE MANUFACTURE OF A CHEMICALLY BONDEDTEXTILE SHEET MATERIAL BASED ON SYNTHETIC FIBERS AND HAVING A HIGH WATER VAPOR ABSORPTION CAPACITY

Klaus-Dieter Hammer, Finthen, and Herbert Porrmann, Konigshofen, both of Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

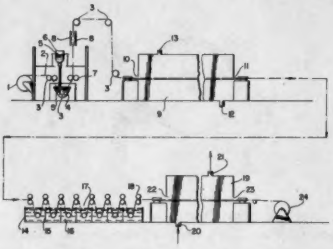
Filed Oct. 13, 1970, Ser. No. 80,335

Claims priority, application Germany, Oct. 15, 1969, 1951977; Sept. 22, 1970, 2046664

Int. Cl. B44d *1/44, 1/06*

U.S. Cl. 117—63 **20 Claims**

This invention relates to a process for the manufacture of chemically bonded, textile sheet material based on synthetic fibers, in which a polymer material in the form of a solution or dispersion is incorporated in the flexible textile sheet material and the polymer material is then coagulated, which comprises impregnating the textile sheet material containing synthetic fibers with a liquid binder system containing (a) a liquid aqueous dispersion of an elastomer, (b) a liquid aqueous solution of a hydrophilic polymer, and (c) a liquid aqueous emulsion of a long-chain aliphatic monoisocyanate and/or diisocyanate, or an aqueous dispersion of an ethylene imine reaction product of a monoisocyanate and/or a diisocyanate; heating the textile



sheet material to the coagulating temperature of the elastomer; further heating the impregnated textile sheet material to a temperature in excess of 100°C, but below the softening temperature of the fibers contained in the textile sheet material; treating the sheet material with a washing liquid; and drying the sheet material.

3,791,850

FORMABLE, WELDABLE COATED ARTICLE OF MANUFACTURE

Robert V. Deshay; Robert A. Isaksen, both of Longmeadow, and Atam P. Sahni, Springfield, all of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 30, 1971, Ser. No. 176,236

Int. Cl. B23k *11/10;* **B32b** *15/04*

U.S. Cl. 117—75 **9 Claims**

Disclosed herein are formable, weldable articles of manufacture comprising a metal sheet coated with a first coating of metal phosphate and a second coating comprising a blend of polyvinyl butyral and phenolic resins in at least one non-corrosive organic solvent which is a solvent for each component of the resin blend having dispersed therein a basic zinc chromate and a particular atomized aluminum powder.

3,791,851

PROCESS FOR HEAT TREATING PLASMA-CONSOLIDATED BERYLLIUM

Thomas A. Taylor, and Robert J. Baird, both of Indianapolis, Ind., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sept. 28, 1970, Ser. No. 76,258

Int. Cl. B05k *7/22*

U.S. Cl. 117—93.1 PF **10 Claims**

A three stage process for heat treating plasma-consolidated beryllium to produce highly densified beryllium having a theoretical density greater than 99 percent.

3,791,852

HIGH RATE DEPOSITION OF CARBIDES BY ACTIVATED REACTIVE EVAPORATION

Rointan F. Bunshah, Los Angeles, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

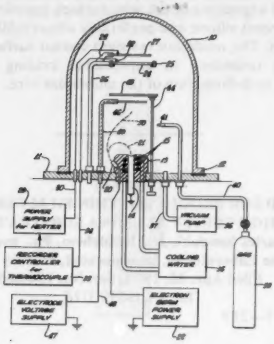
Filed June 16, 1972, Ser. No. 263,708

Int. Cl. C23c *11/08*

U.S. Cl. 117—93.2 **11 Claims**

Process and apparatus for the production of carbide films at high rates by physical vapor deposition. The metal is evaporated in a vacuum chamber by an electron beam, the

hydrocarbon gas is introduced into the chamber, and the metal vapor atoms and gas atoms are activated by electrons deflected from the electron beam to the reaction zone by a low voltage electrode at the reaction zone. The reaction takes



place primarily in the vapor phase in the reaction zone, rather than on the substrate. A high reaction efficiency is obtained with the activated atoms and a deposition rate in the range of 1 to 12 micrometers per minute and higher is achieved.

3,791,853

THERMAL COATED BOOMS FOR SPACECRAFT

Michael Lauriente, Clarksville, and Ernst R. Pemsel, Jr., Ellicott City, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 742,191, July 3, 1968, Pat. No. 3,622,400. This application July 28, 1971, Ser. No. 166,965

Int. Cl. B64g *1/00*

U.S. Cl. 117—97 **8 Claims**

A spacecraft boom having improved resistance to thermally induced bending forces resulting from solar radiation is disclosed, comprising a beryllium containing copper base alloy having a highly absorbent coating disposed on the interior and a highly reflective coating on the exterior. A process is disclosed for manufacturing such booms including a coating, milling, forming and heat treating to obtain the finished product.

3,791,854

FLAME RETARDANT FABRIC BLENDS

Thomas D. Miles, Marlboro, Mass., and Armando C. Delasanta, Woonsocket, R.I., assignors to The United States of America as represented by the Secretary of the Army, Alexandria, Va.

Filed Nov. 2, 1971, Ser. No. 195,011

Int. Cl. C09d *5/18*; **D06m** *13/26*

U.S. Cl. 117—136 **4 Claims**

Flame retardance-producing compositions for fabric blends comprising thermoplastic fibers, such as polyester fibers, and cellulose fibers, such as cotton fibers, comprising mono (2,3 dibromopropyl) phosphoric acid, a water-soluble cyclic nitrogen-containing polymerizable monomeric compound, and a catalytic amount of tetrakis (hydroxymethyl) phosphonium chloride in aqueous solution, the method of rendering a fibrous organic fabric flame retardant by the application of the flame retardance-producing composition to such a fabric, including drying the fabric, and the flame retardant fibrous organic fabric produced by the method using the flame retardance-producing composition therein.

3,791,855

VAPOR PHASE INHIBITOR CONTAINING BENZOTRIAZOLE AND TOLYLTRIAZOLE MIXTURES

Charles J. Korpics, 4107 Barbara Dr., Toledo, Ohio

Continuation of Ser. No. 152,528, June 14, 1971. This application Mar. 9, 1973, Ser. No. 339,526

Int. Cl. C23f *11/14*, *11/04*; **D21h** *5/22*

U.S. Cl. 117—154 **2 Claims**

Solutions of mixtures of benzotriazole and tolyltriazole in water and organic solvents such as benzene and tetrachloroethylene are disclosed. The aqueous solutions contain 40 to 98 percent by weight of benzotriazole and from 60 percent to 2 percent by weight of tolyltriazole, on a solids basis. The aqueous solutions may also contain sodium hydroxide, potassium hydroxide or another pH control agent, and may also contain isopropanol, ehtylene ethylene or another organic solubilizer that is soluble in water. Aqueous solutions according to the invention are useful as additives for cooling water because of the ability of both benzotriazole and tolyltriazole to inhibit metal corrosion. The benzene solutions contain 2 to 98 percent by weight of benzotriazole and from 98 percent to 2 percent by weight of tolyltriazole, on a solids basis. The tetrachloroethylene solutions contain 2 to 98 percent by weight of benzotriazole and from 98 to 2 percent by weight of tolyltriazole, on a solids basis. Benzene — benzotriazole/tolyltriazole solutions are useful in unleaded gasolines, and tetrachloroethylene — benzotriazole/tolyltriazole solutions are useful as dry-cleaning or metal-cleaning additives. Benzotriazole/tolyltriazole impregnated paper for use as a vapor phase corrosion inhibitor for copper and copper alloys may be produced without the use of a solvent system.

3,791,856

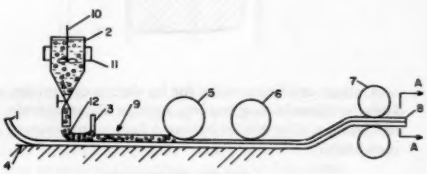
METHOD OF PREPARING POLYMER COATED-WAX IMPREGNATED CELLULOSIC STOCK

Irl N. Duling, West Chester, and John C. Merges, Jr., Glen Mills, both of Pa., assignors to Sun Research and Development Co., Philadelphia, Pa.

Continuation-in-part of Ser. No. 884,847, Dec. 15, 1969, abandoned, which is a continuation-in-part of Ser. No. 745,884, July 18, 1968, abandoned. This application July 15, 1971, Ser. No. 163,041

Int. Cl. D21h *1/28*, *1/36*

U.S. Cl. 117—155 UA **9 Claims**



Porous cellulosic stock can be coated with a thermoplastic polymer coating while being impregnated with a wax by this invention. A dispersion of polymer particles in molten wax is applied to cellulosic stock at a temperature below the melting point of the polymer. This treated cellulosic stock is then heated to a temperature above the melting point of the polymer and subjected to pressure. The resulting laminated product is polymer coated-wax impregnated cellulosic stock. The polymer used must be substantially insoluble in the molten wax at a temperature below the melting point of the polymer and must be fusible below a temperature which would degrade the stock. This product has utility as a packaging material comprising a high water vapor barrier coupled with a tough, scuff-resistant, non-blocking surface.

3,791,857

GELATIN-CONTAINING PHOTOGRAPHIC LAYERS HAVING IMPROVED PHYSICAL PROPERTIES

Gerhard Balle, Cologne; Wolfgang Himmelmann, Opladen; Otto Ernst, Leverkusen, and Fritz Nittel, Cologne, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 17, 1971, Ser. No. 172,554

Claims priority, application Germany, Aug. 20, 1970, 2041323

Int. Cl. G03c *1/04*

U.S. Cl. 117—161 KP 3 Claims

The mechanical properties of gelatin layers are improved by the addition of a graft polymer of a cationic or anionic polyurethane, with polymerizable vinyl compounds.

3,791,858

METHOD OF FORMING MULTI-LAYER CIRCUIT PANELS

Alexander J. McPherson, Binghamton, and Herman C. Scheer, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 812,700, April 2, 1969, abandoned. This application Dec. 13, 1971, Ser. No. 207,500

Int. Cl. B44d *1/18*

U.S. Cl. 117—201 11 Claims

A process for producing multi-layer printed circuit panels using additive techniques for forming the conductors within each layer. The conductors are built up by metal deposition through photo-sensitive masks which are subsequently removed and replaced with fluid dielectric curable to a solid form. Additional layers are formed successively by repeating the process.

3,791,859

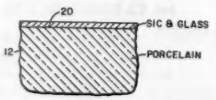
STRESS GRADING COATINGS FOR INSULATORS

Chikara Hirayama, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 4, 1972, Ser. No. 223,540

Int. Cl. H01b *17/42*

U.S. Cl. 117—201 11 Claims



A stress grading coating for insulators comprising a nonlinear semiconducting coating, such as silicon carbide, or the like using a glass binder having a fusion temperature of less than 850°C.

3,791,860

COATED ALUMINUM WELDING ELECTRODE AND FILLER ROD

Walter G. Zelley, Lower Burrell, and William M. Rogerson, New Kensington, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 27, 1971, Ser. No. 212,785

Int. Cl. B23k *35/00, 35/22*

U.S. Cl. 117—202 13 Claims

A method of manufacturing a welding electrode or filler rod by cleaning the surface of an aluminum wire rod and applying to the cleaned surface an aqueous solution of an alkali metal silicate having a concentration of greater than 0.5 percent for a period of greater than 5 seconds at a temperature in excess of 140°F in order to establish a thin, oxidation resistant reacted silicate coating on the aluminum surface. Subsequently rinsing and drying the coated aluminum wire or rod. The reacted silicate coating is provided in such a fashion that it has a thickness such that the outermost 1,000 angstroms of the aluminum surface has about 0.10 to 1.25 percent silicon.

An aluminum welding rod or electrode having a thin reacted oxidation barrier coating on the exterior surface thereof. The oxidation barrier coating is such that the outermost 1,000 angstroms of the wire surface contains about 0.10 to 1.25 percent silicon and preferably about 0.50 to 0.80 percent silicon. The oxidation resistant coated surface is characterized by resistance to appreciable crazing and flaking responsive to deformation of the aluminum wire.

3,791,861

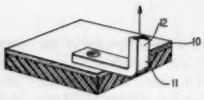
METHOD FOR PRODUCING THIN FILM CIRCUITS ON HIGH PURITY ALUMINA SUBSTRATES

Robert Charles Sundahl, Jr., Bethlehem, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 16, 1971, Ser. No. 134,665

Int. Cl. H05k *3/18*

U.S. Cl. 117—213 14 Claims



In the production of thin film circuits, adhesion of the metallization to the surface of high purity alumina substrates is enhanced by annealing the substrates prior to metallization.

3,791,862

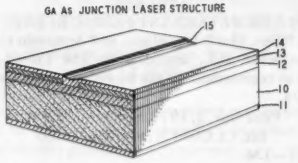
CHEMICAL GROWTH OF INSULATING LAYERS ON GALLIUM ARSENIDE

Robert Edmund Albano, Scotch Plains, and John Cameron Dyment, Chatham, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 156,886, June 25, 1971, abandoned. This application Dec. 22, 1971, Ser. No. 210,992

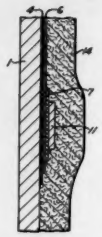
Int. Cl. B44d *1/20;* C23b *5/62*

U.S. Cl. 117—213 12 Claims



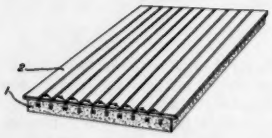
A process is described for the fabrication of gallium arsenide devices in which insulating layers are chemically grown on gallium arsenide using a pH adjusted peroxide solution as the chemical agent. This procedure has the advantage that it can be carried out at room temperature using fairly simple inexpensive equipment and without introducing additional foreign cations into the process which could contaminate the gallium arsenide.

3,791,863
METHOD OF MAKING ELECTRICAL RESISTANCE DEVICES AND ARTICLES MADE THEREBY
Virgil P. Quirk, St. Marys, Pa., assignor to Stackpole Carbon Company, St. Marys, Pa.
Filed May 25, 1972, Ser. No. 256,757
Int. Cl. C23b 5/64; B05b 7/20
U.S. Cl. 117—217 12 Claims



An insulating substrate or surface is provided with a flame-sprayed porous electrical resistance coating, impregnated with dielectric material to fill its pores. If the support is metal, it is first provided with a flame-sprayed porous insulating coating that likewise is impregnated with dielectric material. Metal is flame-sprayed onto the resistance coating to form terminals. By using resistance material with a negative temperature coefficient of resistivity, such as a ceramic ferrite, when the resistance coating is used for heating purposes, the article to which it is applied can be prevented from becoming overheated.

3,791,864
METHOD OF ORNAMENTING ARTICLES BY MEANS OF MAGNETICALLY ORIENTED PARTICLES
Erich Steingroever, Bonn, Germany, assignor to Magnetfabrik Bonn G.m.b.H., Bonn/Bad Godesberg and Weilburger Lackfabrik J. Grebe, Weilburg/Lahn, both of, Germany, part interest to each
Filed Nov. 5, 1971, Ser. No. 196,171
Claims priority, application Germany, Nov. 7, 1970, 2054934
Int. Cl. H01f 10/00
U.S. Cl. 117—238 14 Claims



A patterned effect can be produced in coatings applied to any surface by employing a preliminary coating which includes a liquid vehicle in which permanent magnet particles are suspended; the coating being applied and then hardened, after which the particles are magnetized under the influence of magnetic lines of force arranged in a predetermined pattern, and another coating containing magnetically orientable particles is applied, which particles become oriented by the magnetic field product by the particles first applied.

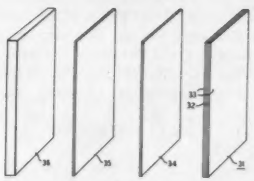
3,791,865
HIGH MALTOSE SYRUPS
Thomas L. Hurst, and Almerin W. Turner, both of Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.
Filed May 12, 1969, Ser. No. 823,937
Int. Cl. C12d 13/02
U.S. Cl. 127—32 8 Claims

Storage stable high maltose starch conversion syrups having a minimum F.E. of 85%, a minimum D.E. value (dextrose equivalent) of about 50%, a maltose content of about 60 to 80% and a maltotriose content of 15 to 35%, and method for producing said syrups wherein a starch paste containing at least 5% by weight solids is saccharified with a maltogenic enzyme and amylo-1,6-glucosidase.

3,791,866
RECOVERY OF WASTE BRINE REGENERANT
Robert Kunin, Yardley, and William Fries, Southampton, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.
Filed Aug. 7, 1972, Ser. No. 276,018
Int. Cl. C13d 3/14
U.S. Cl. 127—46 A 7 Claims

Saline solutions, used to regenerate exhausted porous anion exchange resins loaded with organic color bodies resulting from sugar syrup purification, may be re-used after treatment with an oxidizing reagent such as hydrogen peroxide, sodium hypochlorite or calcium hypochlorite.

3,791,867
RECHARGABLE NONAQUEOUS BATTERY
John Broadhead, Morristown, and Alexander Duane Butherus, Murray Hill, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed July 24, 1972, Ser. No. 274,596
Int. Cl. Holm 35/02
U.S. Cl. 136—6 R 10 Claims



A nonaqueous battery is described which employs a conventional nagative electrode and a positive electrode in which the active material is incorporated in the layered structure of a transition metal chalcogenide. Such positive electrode structures may be utilized completely and are rechargeable.

3,791,868
METHOD OF MAKING A BATTERY CELL HAVING A COILED METALLIC FOIL CATHODE MEMBER
Charles E. Compton, Martinez, and William H. Taplin, III, Lafayette, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.
Continuation-in-part of Ser. No. 70,146, Sept. 8, 1970, abandoned. This application May 12, 1972, Ser. No. 252,624
Int. Cl. H01m 35/16
U.S. Cl. 136—13 9 Claims

The invention is an improved process for making a battery cell having as an electrode a metallic sheet wound into a vertical coil of spaced apart layers. The use of a thin metallic foil as such an electrode is made feasible by:

1. disposing a metallic spacer strip between the foil layers adjacent to their lower edges

2. radially compressing the spacer strip and the foil into close contact, and
3. forming at least one common electrical connection between the spacer strip and foil edges by heli-arcing a weld bead on the bottom of the assembly.

3,791,869

STORAGE BATTERY ELECTRODE

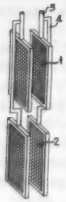
Jurgen Brinkmann, Berenbostel; Manfred Rasche, Hagen, and Willi Heissmann, Nachrodt, all of Germany, assignors to Varta Aktiengesellschaft, Frankfurt/Main, Germany

Filed June 26, 1972, Ser. No. 266,162

Claims priority, application Germany, July 1, 1971, 2132690

Int. Cl. H01m *35/32*

U.S. Cl. 136—81 **19 Claims**



The plate electrodes of storage batteries having large vertical dimensions are made up of two or more vertically spaced plate segments. Connectors are provided which link these segments mechanically together, and which connect them electrically in parallel.

3,791,870

PROCESS FOR REACTIVATING A FUEL CELL BATTERY

Horst Grune, Kelkheim/Taunus, Germany, assignor to Varta Aktiengesellschaft, Frankfurt/Main, Germany

Filed Apr. 13, 1970, Ser. No. 28,095

Claims priority, application Germany, Apr. 11, 1969, 1918353

Int. Cl. H01m *27/00*

U.S. Cl. 136—86 E **14 Claims**

Process for activating a hydrogen electrode in a fuel cell during or prior to the operation of the cell by supplying hydrogen to both electrodes for a specified limited time, establishing certain electrically conductive conditions for a specified time, and discontinuing the hydrogen supply to the oxygen electrode. The cell then resumes its optimum operating capacity.

ERRATUM

For Class 136—86 A see:
Patent No. 3,791,896

3,791,871

ELECTROCHEMICAL CELL

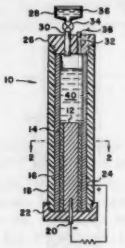
Leroy S. Rowley, San Jose, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Apr. 14, 1971, Ser. No. 133,833

Int. Cl. H01m *13/00*

U.S. Cl. 136—100 R **15 Claims**

The effective generation of electrical power is provided utilizing materials which are both chemically and electrochemically highly reactive with one another, in particular, alkali metals and water. The transport of water molecules to the alkali metal anode surface is restricted in the electrolyte. In a simple single stage cell an alkali metal hydroxide aqueous solution electrolyte is provided between an alkali metal anode and a non-reactive metal cathode at a sufficiently high concentration to prevent melting of the anode or thermal runaway. No other chemical or mechanical intermediary is



required. Electrical power is obtained by continuously adding to the electrolyte during operation a controlled restricted quantity of water proportional to the electrical current withdrawn from the cell. No external heating is required and the cell operates near room temperature. The control of the rate of water addition may be used to control the power output of the cell.

3,791,872

METHOD FOR PRODUCTION OF ELECTRODE FOR ELECTROCHEMICAL CELLS

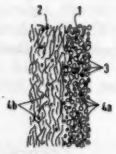
Ferdinand V. Sturm; Walter Naschwitz, both of Erlangen; Werner Rummel, Grossdechsendorf, and Dieter Groppel, Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Erlangen and Berlin, Germany

Filed June 30, 1971, Ser. No. 158,459

Claims priority, application Germany, July 1, 1970, 2032549

Int. Cl. H01m *13/04*

U.S. Cl. 136—120 FC **10 Claims**



An electrode for electrochemical cells constituting a porous cover layer of fibrous material and a layer of pulverulent catalyst. The catalyst particles are connected with each other as well as with the cover layer by means of a binder. The cover layer contains a binder. A butadienestyrene acrylonitrile copolymer is present in the catalyst layer. Also described is a method for producing the electrode.

3,791,873

CLOSURE SEAL FOR ELECTROCHEMICAL CELLS

Stephen J. Angelovich, Yonkers, N.Y., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

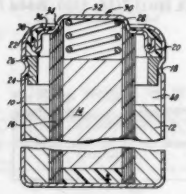
Filed Nov. 2, 1970, Ser. No. 85,840

Int. Cl. H01m *1/02*

U.S. Cl. 136—133 **4 Claims**

A Closure Seal for an electrochemical cell comprises a metal can constituting one of the terminals of the cell, a top

closure means for the can constituting the other terminal of the cell, an insulating sealing means confined between cooperating portions of the can and of the closure means, a radial constriction in the upper wall portion of said can and spaced below the sealing means, and an insulating supporting



member positioned into the space below said sealing means and above said constriction.

When the upper rim of the metal can is crimped down to press against the sealing means thereby to seal the cell, the supporting member prevents distortion of the sealing means.

3,791,874

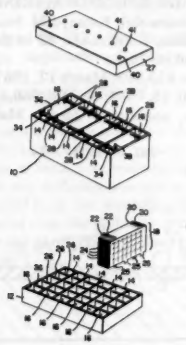
BATTERY CONTAINER

Frederick J. Port, West Chester, Pa., assignor to ESB Incorporated, Philadelphia, Pa.

Division of Ser. No. 871,207, Oct. 17, 1969, Pat. No. 3,746,579, which is a division of Ser. No. 726,068, May 2, 1968, Pat. No. 3,519,489. This application Mar. 16, 1973, Ser. No. 341,969

Int. Cl. H01m *1/02*

U.S. Cl. 136—134 R **12 Claims**



A battery has a container consisting of an upper portion and a lower portion sealed together in any convenient manner. The cover may be separate from, or integrally constructed with, the upper portion of the container. Single cell or multicell as well as primary or secondary batteries may be so constructed.

In multicell batteries the intercell strap connectors extend through the partitions of the cell compartments, preferably as molded inserts in the partitions. Preferably the ends of the intercell strap connectors are anchored by the container. Strap connectors may extend from end cells through the container as inserts molded therein to function as terminals.

3,791,875

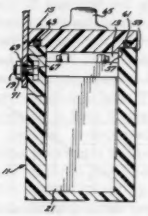
UNDERWATER WET CELL BATTERY CASE

Carlton L. Koehler, P.O. Box 236, Avalon, Calif.

Filed Aug. 7, 1972, Ser. No. 278,450

Int. Cl. H01m *1/04*; A45c *11/22*

U.S. Cl. 136—173 **6 Claims**



An underwater wet cell battery case for housing a battery to drive an underwater electrical device and including a housing formed with a body defining a battery-receiving cavity and including a cover secured to such body and cooperating therewith to form a water-tight seal. A mounting bracket is formed with a belt loop for securement to a scuba diver's belt and includes swivel means connecting the case thereto for pendulum pivoting of such housing to enable a battery to be placed therein and maintained in an upright position irrespective of maneuvers undertaken by the diver.

3,791,876

METHOD OF MAKING HIGH STRENGTH ALUMINUM ALLOY FORGINGS AND PRODUCT PRODUCED THEREBY

Paul W. Kroger, San Gabriel, Calif., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 164,912, July 21, 1971, abandoned, which is a continuation-in-part of Ser. No. 823,997, May 12, 1969, abandoned. This application Oct. 24, 1972, Ser. No. 300,153

Int. Cl. C22f *1/04*

U.S. Cl. 148—2 **40 Claims**

An aluminum base alloy containing zinc, magnesium and copper is fabricated into a forging having very high strength. The alloy is cast, homogenized and fabricated into wrought forging stock, preferably by extrusion, under specially prescribed conditions. This stock is soaked, forged, solution heat treated and aged under herein prescribed conditions.

3,791,877

METHOD FOR TREATING MILITARY EQUIPMENT

Joseph V. Otrhalek, Dearborn, and Russell S. Banush, Trenton, both of Mich., assignors to Basf Wyandotte Corporation, Wyandotte, Mich.

Filed Jan. 20, 1972, Ser. No. 219,516

Int. Cl. C23f *7/10*

U.S. Cl. 148—6.15 Z **3 Claims**

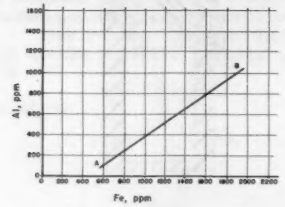
Ferrous metal substrates, and in particular, military ammunition or armament, is rendered corrosion resistant by the application thereonto of a film-forming composition consisting essentially of an organic solvent having a maximum flash point of about 150°F. and a calcium soap of a mixture of organic acids, lactones and esters. When the composition dries on the substrate, a camouflaging olive drab color is imparted thereto.

3,791,878

METHOD OF OBTAINING DUCTILE BERYLLIUM

William Taylor, Wyomissing; William O. Frauson, Conyngham, and Stanley Chinowsky, Reading, all of Pa., assignors to Kawecki Berylco Industries, Inc., New York, N.Y.

Filed Mar. 25, 1971, Ser. No. 127,972
Int. Cl. C22f 1/18
U.S. Cl. 148—11.5 F 2 Claims



A critical relationship is described between the rate of cooling of beryllium from a stress-relieving or forming temperature and the indigenous iron-to-aluminum impurity ratio in mechanically worked beryllium, with resulting improvement in its ultimate ductility.

3,791,879

SOLDER FLUX COMPOSITION

Harold Goldfarb, Walnut, and Christopher Valsamakis, Huntington Beach, both of Calif., assignors to North American Rockwell Corporation, El Segundo, Calif.

Continuation of Ser. No. 201,138, Nov. 22, 1971, abandoned. This application May 21, 1973, Ser. No. 361,917
Int. Cl. B23r 35/34; C07c 29/00
U.S. Cl. 148—23 1 Claim

A fluxing composition suitable for soldering electrical connections and characterized by producing a bright and shiny solder joint comprising about 40 to 65 percent by weight of polypropylene glycol and 35 to 60 percent by weight rosin.

3,791,880

TEAR RESISTANT SHEET AND PLATE AND METHOD FOR PRODUCING

Harold Y. Hunsicker, and James T. Staley, both of Lower Burrell, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 58,337, July 27, 1970, abandoned. This application June 30, 1972, Ser. No. 267,973
Int. Cl. C22f 1/04
U.S. Cl. 148—11.5 A 20 Claims

An aluminum base alloy of the aluminum-zinc-magnesium-copper-chromium type with specially controlled composition limits is provided as a sheet or plate type product having the high strength and good resistance to stress corrosion cracking normally associated with this type of alloy but also having exceptional resistance to tearing. Certain prescribed fabrication procedures including thermal treatments are preferably followed in producing the improved product.

3,791,881

ANNEALING TREATMENT FOR CONTROLLING WARHEAD FRAGMENTATION SIZE DISTRIBUTION

George A. Hayes, China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Arlington, Va.

Filed Mar. 2, 1972, Ser. No. 231,429
Int. Cl. C21d 9/16, 1/50; F42b 13/18
U.S. Cl. 148—143 1 Claim

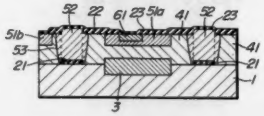
Methods for controlling the sizes and shapes of fragments produced by warhead casings are disclosed.

3,791,882

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES UTILIZING SIMULTANEOUS DEPOSITION OF MONOCRYSTALLINE AND POLYCRYSTALLINE REGIONS

Katumi Ogiue, Kodaira-shi, Japan

Filed Aug. 23, 1967, Ser. No. 662,646
Claims priority, application Japan, Aug. 31, 1966, 41-56903
Int. Cl. H01l 7/36, 5/00; B44d 1/18
U.S. Cl. 148—174 21 Claims



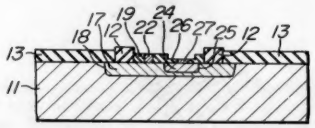
A semiconductor device and a method of manufacturing such device, which includes the step of electrically isolating the respective elements of a semiconductor integrated circuit from each other by means of PN junctions. More specifically, the method disclosed herein includes the steps of forming a silicon dioxide layer on one main surface of an N type silicon substrate in such a manner as to surround a predetermined area of said one main surface, depositing P type silicon layers on said one main surface and said silicon dioxide layer from the vapor phase to integrally form monocrystalline silicon layers and a polycrystalline silicon layer on said one main surface and said silicon dioxide layer respectively, and thereafter introducing an N type impurity from the surface of said polycrystalline silicon layer until it reaches said silicon dioxide layer, thereby defining P type silicon regions surrounded by the N type silicon substrate and the N type polycrystalline silicon layer.

3,791,883

SEMICONDUCTOR ELEMENT HAVING SURFACE COATING AND METHOD OF MAKING THE SAME

Ichiro Takei, Kodaira-shi; Katsuyoshi Sasaki, Jujisawa-shi, and Sumio Nishida, Kodaira-shi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 623,903, March 17, 1967. This application July 15, 1969, Ser. No. 860,450
Claims priority, application Japan, Mar. 23, 1966, 41-17415
Int. Cl. H01l 7/34
U.S. Cl. 148—187 17 Claims



A semiconductor element having a surface coating consisting of, for example, a silicon nitride film and a silicon oxide film covering different surface portions of a semiconductor substrate of, for example, silicon so that such surface coating can be utilized for selective diffusion of impurities such as gallium and antimony. In a semiconductor device thus formed, the surface coating acts as a satisfactory surface protective film against external atmosphere, and the backward characteristics of the PN junction can be improved because the end edge of the PN junction terminating at the substrate surface is covered with the silicon nitride film.

3,791,884

METHOD OF PRODUCING A PNP SILICON TRANSISTOR

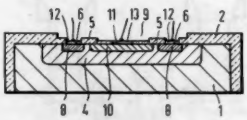
Joachim Dathe; Leo Grasser, both of Munich, and Wolfgang Muller, Vaterstetten, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin, Munich, Germany

Filed Feb. 19, 1971, Ser. No. 116,943

Claims priority, application Germany, Feb. 23, 1970, 2008319

Int. Cl. H01l 7/44

U.S. Cl. 148—187 5 Claims



During the production of a pnp silicon transistor, one side of a p-conducting silicon wafer is provided with a base zone through masked diffusion of phosphorus atoms. A subsequent diffusion process increases the phosphorus concentration at the surface of the base zone to 10^{20} to 10^{21} phosphorous atoms/cm³. The same phosphorus concentration is produced at the opposite side of the silicon wafer. The emitter is produced in the region of the base zone through a masked diffusion of acceptor atoms. Finally, the phosphorus-doped layer is removed from the reverse or back side of the semiconductor wafer.

3,791,885

METHOD OF MANUFACTURING A SEMICONDUCTOR REGION

Kamal Merchant, Heilbronn, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed June 28, 1971, Ser. No. 157,440

Claims priority, application Germany, July 2, 1970, 2032838

Int. Cl. H01l 7/34

U.S. Cl. 148—187 9 Claims

A method of manufacturing a semiconductor region comprises forming a layer of diffusion material over a diffusion window and a layer of insulating material on a semiconductor body and in which the diffusion window is formed, removing the diffusion material from the insulating layer so as to leave the diffusion material over the diffusion window and diffusing the diffusion material through the diffusion window into the semiconductor body.

3,791,886

SOLDER FLUX COMPOSITION

Harold Goldfarb, 859 S. Penarth Ave., Walnut, and Christopher Valsemakis, 22081 Susan St., Huntington Beach, both of Calif.

Continuation of Ser. No. 201,135, Nov. 22, 1971, abandoned. This application Apr. 18, 1973, Ser. No. 352,146

Int. Cl. B23r 35/34; C07c 31/20

U.S. Cl. 148—23 5 Claims

A fluxing composition suitable for soldering electrical connections and characterized by producing a bright and shiny solder joint comprising about 40 to 99 percent by weight of polypropylene glycol and 0.25 to 15 percent by weight phosphoric acid. An optional component in the fluxing composition is 0 to 50 percent by weight rosin.

3,791,887

LIQUID-PHASE EPITAXIAL GROWTH UNDER TRANSIENT THERMAL CONDITIONS

Richard Deitch, Bayside, N.Y., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed June 28, 1971, Ser. No. 157,525

Int. Cl. H01l 7/38

U.S. Cl. 148—172 8 Claims

Thin epitaxial layers of material are grown on a substrate from a saturated solution of a solute dissolved in a metal solvent. The solute and solvent are first mixed and then heated to produce the saturated solution. The solution temperature is maintained while a suitable substrate is heated to and maintained at a temperature which is at least 5°C lower than that of the solution. The substrate is then brought into contact with the solution. Upon contact, a supersaturated condition is produced in the solution proximate to the substrate and a thin epitaxial layer of solute material grows on the substrate as the substrate and solution temperatures approach equilibrium. Layer growth continues until all the supersaturation in the solution is relieved or until the substrate and solution are physically separated.

3,791,888

SOLID PROPELLANTS PREPARED FROM ACIDIC VINYLIDENE POLYMERS USING BOTH POLYAZIRIDINYL AND DIFUNCTIONAL AZIRIDINYL CURING AGENTS

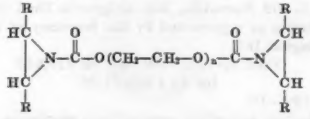
Paul S. Hudson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 23, 1961, Ser. No. 84,450

Int. Cl. C06d 5/06

U.S. Cl. 149—19 15 Claims

1. A solid propellant composition comprising an inorganic oxidizing salt and a synthetic polymer formed by reacting an uncured polymer of a vinylidene-containing monomer selected from the group consisting of conjugated dienes containing from four to 12 carbon atoms, vinyl-substituted aromatic compounds, vinylpyridines, vinylquinolines, vinylisoquinolines, acrylic acid esters, alkacrylic acid esters, nitriles, N,N-disubstituted amides, vinylfuran, and N-vinylcarbazole, said uncured polymer containing at least one acid group of an element selected from the group consisting of sulfur, carbon, selenium, silicon, tin, antimony, tellurium, and arsenic per molecule, with a combination curative containing a compound having at least three 1-aziridinyl radicals in which the ring carbons are bonded to radicals containing up to a total of 20 carbon atoms and selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl, alkaryl and aralkyl radicals and a diaziridinyl compound having the formula



wherein n is an integer of 1 to 2 and each R is selected from the group consisting of hydrogen and alkyl radicals containing from one to four carbon atoms.

3,791,889

FUEL COMPOSITION CONTAINING LITHIUM, CALCIUM AND FLUOROCARBON

Johann Schroder, Drimbornallee 125A, Aachen, Germany

Continuation of Ser. No. 860,977, Sept. 25, 1969, abandoned. This application Mar. 27, 1972, Ser. No. 238,474

Int. Cl. C06d 5/06

U.S. Cl. 149—19.3 6 Claims

A fuel for producing calorific energy by reaction with SF_6, the fuel containing mostly lithium and a solid highly fluorinated compound.

3,791,890

GRANULAR POLYKETONE PREPARATION

Frederick W. Gander, Kennet Square, Pa., and William D. Garlington, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 18, 1972, Ser. No. 227,613
Int. Cl. C08g *23/00*
U.S. Cl. 260—61 6 Claims

An improvement in the preparation of polyketones by Friedel-Crafts synthesis, wherein the reaction mixture is dispersed into a heated fluid, prior to coagulation of the polyketone, to form a granular product.

3,791,891

SOLID COMPOSITE PROPELLANTS WITH VERY HIGH BURNING RATES

Mart G. Baldwin, Newtown, and Lew R. Beason, Ivyland, both of Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 836,176, June 24, 1969, abandoned. This application Apr. 12, 1972, Ser. No. 243,430
Int. Cl. C06d *5/06*
U.S. Cl. 149—19 4 Claims

A fast burning composite propellant comprising a cured intimate mixture of a prepolymer/plasticizer solution wherein the prepolymer is a copolymer of carboranylmethyl acrylate and acrylic acid and the plasticizer is selected from triethylene glycol dinitrate and butane-triol trinitrate and mixtures thereof, an inorganic oxidizing salt, and an additive of metal powder.

3,791,892

CASTABLE POLYURETHANE COMPOSITE PROPELLANTS

Aubrey J. Hammond, Sacramento, and Hyman R. Lobowitz, Redondo Beach, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 24, 1966, Ser. No. 522,779
Int. Cl. C06d *5/06*
U.S. Cl. 149—19.4 17 Claims

A solid propellant with a polyurethane resin binder made from the reaction of a di-isocyanate compound and the condensation product of 1,2-polyoxybutylene glycol with an alkanedioic acid.

3,791,893

FAST BURNING DOUBLE-BASE PROPELLANT

William E. Hill, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 16, 1969, Ser. No. 817,617
Int. Cl. C06b *11/00*
U.S. Cl. 149—19 5 Claims

Double-base propellant compositions employing 1-nitro-2-carboranylpropene (NIPC) as a catalyst are stable compositions which burn at increased rate.

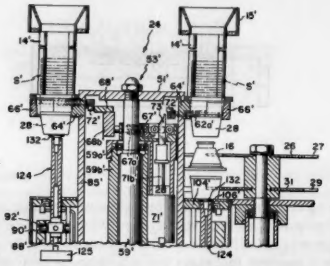
3,791,894

DENESTER SYNCHRONIZER APPARATUS AND METHOD

Robert J. Mistarz, Northbrook, Ill., assignor to Koehring Company, Milwaukee, Wis.

Filed Aug. 28, 1972, Ser. No. 284,035
Int. Cl. B32b *31/16*
U.S. Cl. 156—60 16 Claims

Container assembly apparatus, for joining vertically aligned container halves, wherein apparatus for supplying upper and lower vertically aligned container halves to joining apparatus at a container assembly station is provided. The container half supplying apparatus includes upper and lower container half denesters which move stacks of upper and lower nested container halves in independent paths of travel and successively denest the container halves in the stacks and discharge them at generally laterally spaced, upper and lower container half discharge stations, respectively. The container half supplying apparatus also includes mechanism for moving the discharge upper container sections from the upper half discharge station into juxtaposed relation with the lower container halves discharged at the lower half discharge station, and control



mechanism, operatively connected in circuit with the upper and lower container half denesters, for operating them to insure the release of the upper and lower container halves at appropriate times during the cycle. The control mechanism includes control elements for insuring that the upper and lower container halves, and particularly the initially and the finally released container halves at the upper and lower half discharge stations, are denested and discharged in properly timed relation to provide sets of vertically aligned halves to travel to the container assembly machine.

3,791,895

METHOD OF CUTTING AND DECORATING EGGSHELLS

Sally A. LeVan, 2704 Boyd St., Bethlehem, Pa.

Filed Oct. 3, 1972, Ser. No. 294,502
Int. Cl. B44c *5/00*
U.S. Cl. 156—62 11 Claims

Intricate cutting of an empty eggshell is accomplished by applying over and affixing to the surface of the shell a fine cord, or braid, in a manner so as to produce an artistic design, and cutting out portions of the eggshell bounded by the cord by inserting a drill bit into and within the eggshell and cutting laterally with the drill edge along the boundary of the portion formed by the cord until the enclosed portion is completely cut out.

3,791,896

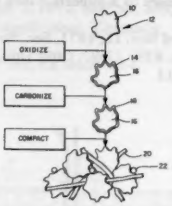
BI-FUNCTIONAL GAS ELECTRODE

Jack C. Sklarchuk, Trenton, N.J., assignor to ESB Incorporated, Philadelphia, Pa.

Filed Dec. 16, 1971, Ser. No. 208,815
Int. Cl. H01m *35/00*, *27/04*
U.S. Cl. 136—86 D 6 Claims

A bi-functional gas electrode is described suitable for use in a rechargeable gas-metal cell or gas-metal oxide cell. A grid

structure such as nickel screen is coated with carbonized nickel powder bonded in place by an organic polymer. The electrode is waterproofed by adhering a sheet of microporous



polyfluorohydrocarbon on one of the surfaces of the electrode. The electrode is suitable for use with such gasses as oxygen, hydrogen carbon monoxide, and numerous carbon hydrogen compounds.

3,791,897

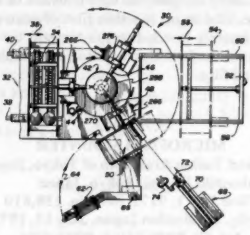
METHOD AND APPARATUS FOR MAKING ENDLESS BELTS

Xavier Mesly, Sherbrooke, Quebec, Canada, assignor to Bombardier Limited, Valcourt, Quebec, Canada

Filed June 16, 1971, Ser. No. 153,696

Int. Cl. B29h *7/22, 17/04, 17/16*

U.S. Cl. 156—137 **20 Claims**



The disclosure herein describes an apparatus which consists of a rotatable turret carrying three horizontally extending shafts, each capable of supporting an improved track-receiving drum, of at least two improved vulcanizers mounted adjacent the turret and movable relative thereto, of an automatic rod applicating device adapted to come in circumferential abutment with the track-receiving drum, of a track-extracting device adapted to be inter-connected with the drum, and of heating and cooling stations having conduits for connection with the drum. The disclosure also describes a new method making snowmobile-type tracks in a more efficient and economical way.

3,791,898

WINDABLE FLEXIBLE SHAFT CAPABLE OF WITHSTANDING HIGH TRACTIVE FORCES AND TORSIONAL STRESSES AND PROCESS FOR MANUFACTURING THE SAME

Reynard Remi, Montesson, France, assignor to Institut Francius Du Petrole Des Carburants Et Lubrifiants, (Hauts de Seine), Rueil-Malmaison, France

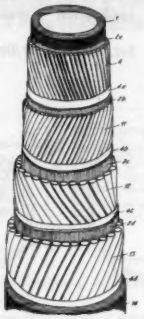
Division of Ser. No. 725,426, April 30, 1968, Pat. No. 3,559,693. This application Oct. 6, 1970, Ser. No. 78,592

Claims priority, application France, May 5, 1967, 67.105469

Int. Cl. B31c *13/00;* **B29h** *7/14*

U.S. Cl. 156—143 **11 Claims**

A process for manufacturing a flexible shaft including a flexible core surrounded with at least one armoring constituted of at least two layers of helically wound metallic wires or cables. This process is characterized in that each armoring layer is provided with an anchoring layer wherein it is embedded, thin anchoring layer being constituted of an elastomeric or thermoplastic material which has been subjected to a thermal treatment, in combination with a thin hooping and separating layer which covers the armoring layer and is constituted of a material which can withstand the thermal treatment without flowing, thin material preferably retracting under the conditions of this thermal treatment.



3,791,899

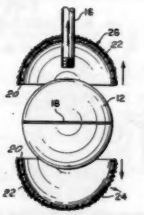
METHOD OF MAKING ORNAMENTAL HOLLOW PLASTIC ARTICLES

Ben Walters, 4600 E. 11th Ave., Miami Beach, Fla.

Filed Apr. 15, 1971, Ser. No. 134,187

Int. Cl. B29c *21/00*

U.S. Cl. 156—152 **5 Claims**



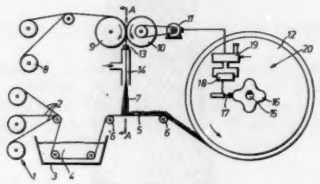
A process for making a hollow, ornamental, plastic article which has a smooth interior surface to which is bonded a randomly arranged layer of pellets forming the outer surface and extending outwardly therefrom. The pellets provide a radiating and lighting surface to dissipate heat from a light source positioned within the article and diffusing the light. The article is produced by placing a layer of plastic powder upon a heated surface of a mold in the form of the article, heating the layer to make it tacky and distributing a layer of pellets of a compatible plastic material over the tacky layer of powder, and heating the pellets until they become soft and cooling the mold and article so that the pellets adhere to each other and to the layer and removing the article from the mold.

3,791,900

PROCESS AND APPARATUS FOR THE PRODUCTION OF HOLLOW BODIES FROM REACTION RESINS, WHICH ARE REINFORCED WITH FIBRES

Leonard Goerden, Oedt, and Franz Gromping, Krefeld, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 24, 1972, Ser. No. 220,055
Claims priority, application Germany, Feb. 9, 1971, 2105955
Int. Cl. B65h 81/06
U.S. Cl. 156—171 24 Claims



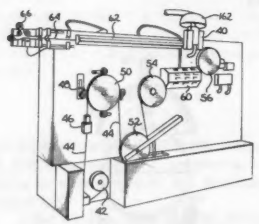
Glass fibre reinforced hollow bodies, e.g. pipes produced from reaction resins, are produced by a winding process whereby the fibres are fed to a supporting layer as endless rovings with a speed which is higher than the circumferential speed of the winding core whereby the supporting layer supplies the rovings to the winding core at a speed equal to the circumferential speed of the latter.

3,791,901

METHOD AND APPARATUS FOR MAKING POTENTIOMETER WINDINGS

Louis Beauregard, North Hollywood, Calif., assignor to Techno-Components Corp., Van Nuys, Calif.

Filed Feb. 22, 1971, Ser. No. 117,652
Int. Cl. B32b 81/08
U.S. Cl. 156—172 7 Claims



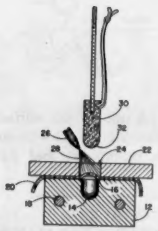
A method and apparatus for making potentioneter windings whereby the potentiometer wire is wound on an insulated mandrel and thereafter a mixture of adhesive and solvent is sprayed over the wound mandrel from one side of the mandrel. By controlling the spray, the adhesive may be limited to approximately 180° of the mandrel periphery, thereby securing the potentiometer wire to the mandrel over approximately half the mandrel area while leaving clean and uncovered the areas of the mandrel which will become the wiper track and the areas in which end connections and taps will be attached. The spraying process may be accomplished as a separate operation after winding the potentiometer wire on the mandrel, or as a continuous process by an addition of the apparatus of the invention to a suitable winding machine. The apparatus of the invention adapts a conventional artists air brush for use as a sprayer and provides all adjustments and controls necessary to achieve the desired result.

3,791,902

METHOD FOR COATING TAMPONS WITH WATER-SOLUBLE FILM

David E. Hanke, Neenah, and Richard R. Tews, Menasha, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Nov. 12, 1971, Ser. No. 198,278
Int. Cl. B29c 17/02; C09j 5/02; A61f 13/20
U.S. Cl. 156—212 7 Claims



A method for coating the tip of a compressed absorbent tampon with a thin film of water-soluble plastic. The uncoated surface of the prefabricated film, such as polyvinyl alcohol, which is to be applied to the tampon is solvent-activated by humidifying the film or by the application thereto of a plasticizing fluid. While the film surface is still activated the film is molded onto the tampon tip by means of a heated tip-conforming die. The result is a thin film of unstressed polyvinyl alcohol intimately bonded to the tampon tip over the entire film-tampon interface by the autogenous adhesive power of the plasticized film.

3,791,903

MICROFILM MOUNTER

Kokichi Omi, and Toshio Arai, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed July 1, 9171, Ser. No. 158,810
Claims priority, application Japan, July 11, 1970, 45-60739
Int. Cl. B32b 31/18; B31b 1/24
U.S. Cl. 156—517 10 Claims

A film mounter for cutting a long film such as pre-recorded microfilm or the like into pieces of a predetermined size and mounting such pieces of film onto apertured cards. The film mounter is equipped with a cutter device which normally consists of a movable cutter member and a pair of stationary cutter members. The movable cutter has a pair of cutting edges and the stationary cutter has a wedge-shaped transverse slot having a cutting edge, the film being cut by their cooperation. The stationary cutter is pivotally supported on a frame so that the resilient and forceful contacts between the cutting edges of the movable cutter and the stationary cutter are assured. Furthermore the relative movement between the movable and stationary cutters provide self-sharpening due to the close contact between them. Accordingly an excellent cutting performance can be always expected.

3,791,904

FEEDER FOR LABELLING MACHINES

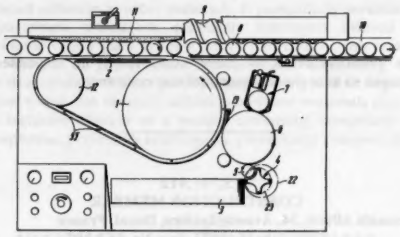
Ernst Schlacht, Berlin, Germany, assignor to Johann Weiss, Maschinenfabrik und Apparatebau GmbH, Berlin, Germany

Filed July 7, 1972, Ser. No. 269,547

Claims priority, application Germany, July 20, 1971, 2136908

Int. Cl. B65c 9/14

U.S. Cl. 156—571 4 Claims



A feeder mechanism incorporated in a machine for attaching labels to work units. The feeder mechanism cooperates with and singly extracts labels from a label container, carries and delivers the singled labels to a gumming drum which passes the gummed, singled labels to a label-applicator device. The feeder has plural arms, being a substantially star-shaped unit, each arm being provided with label singling and receiving surfaces containing controlled suction apertures for holding the labels. A planetary or epicyclic gearing drives the star-shaped feeder so each label receiving surface passes along a cycloid path.

3,791,905

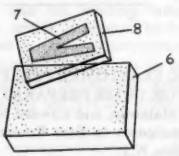
METHOD FOR TRANSFERRING INFORMATION PRINTED ON A CLAY-COATED SUBSTRATE TO A TRANSPARENT SUBSTRATE FOR THE PURPOSE OF MAKING SLIDES

Donald Joseph Molner, Englishtown, N.J., assignor to Q. S. Industries, Inc., New York, N.Y.

Filed Feb. 19, 1971, Ser. No. 116,861

Int. Cl. B32b 31/24; B44c 1/16

U.S. Cl. 156—235 4 Claims



A method of making slides using a transfer process including contacting a clay-coated image bearing surface with an adhesive coated transparent substrate, burnishing the image and the transparent substrate and separating the transparent substrate from the original image bearing surface whereby a transfer of the image to the substrate is accomplished which is suitable for conventional image projection.

3,791,906

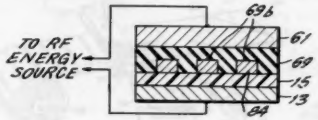
METHOD OF USING A COMPRESSIBLE DIE MEMBER TO FORM PATTERNS ON A PLASTIC SHEET INCLUDING THE USE OF A LIQUID PLASTISOL AND DIELECTRIC HEATING

Robert D. Farkas, 772 Prospect St., Westfield, N.J.

Continuation-in-part of Ser. No. 112,692, Feb. 4, 1971, abandoned. This application Dec. 9, 1971, Ser. No. 206,363

Int. Cl. B29c 19/04; B29h 5/26

U.S. Cl. 156—245 1 Claim



A die assembly incorporating a resilient die face and/or backing for sealing and/or patterning or texturing plastic and other like material through the use of RF heating. The die face contains all of the texturing, embossing, printing and the like of the surface of the material or object being simulated. The die face and/or the resilient backing material are imbedded or otherwise provided or formed with conductive and/or resistive material to enhance the dielectric heating operation, as well as to provide heat flow toward the plastic load immediately upon the institution of the RF heating operation.

The resilient die faces may be integrated with the cutting edges forming fixed or compound die assemblies for cutting and/or sealing operations which may be performed substantially contemporaneously with the patterning or texturing operations.

3,791,907

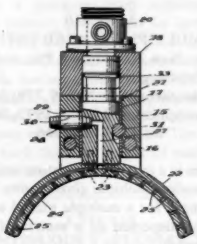
METHOD AND APPARATUS FOR SECURING THE TAIL CONVOLUTION OF A ROLL

Robert L. Marcalus, One Market St., East Paterson, N.J.

Filed Nov. 1, 1971, Ser. No. 194,244

Int. Cl. B32b 31/00

U.S. Cl. 156—253 7 Claims



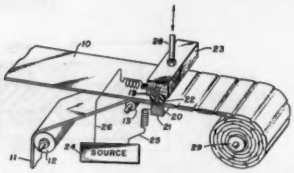
A method and apparatus for causing adherence of the tail end portion of a wound paper roll to underlying convolutions at and in connection with the sawing off of the rolls from logs. Operating in timed relation with the saw is a manifold which extends partway around a portion of the log in advance of the sawing operation and having means for applying spots of water or other liquid to the peripheral portion of the log. Additional means is related thereto for penetrating the external portion of the log at the spots of water or liquid to cause the liquid to enter into the log and for adherence of the convolutions during the subsequent cutting and packaging of the rolls.

3,791,908

METHOD OF HEAT SEALING POROUS MATERIALS

Lester Gidge, Nashua, N.H., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 71,656, Sept. 14, 1970, Pat. No. 3,671,709. This application Dec. 2, 1971, Ser. No. 204,342
Int. Cl. B29c *27/02*
U.S. Cl. 156—273 5 Claims



An apparatus for seam bonding layers of fabric by radio frequency power is provided with electrodes at least one of which is flanked by and is recessed in a resilient insulating member which acts to fill the voids in the fabric during bonding and resultingly prevents electrical arcing through the fabric.

3,791,909

METHOD OF LAMINATING POLYIMIDE FILM

Ian K. McKee, Princeton, N.J., assignor to Circuit Materials Division Dodge Industries, Inc., Hoosick Falls, N.Y.

Filed Jan. 12, 1972, Ser. No. 217,229
Int. Cl. C09j *5/02*; B32b *31/12*
U.S. Cl. 156—306 5 Claims

A process of laminating a polyimide film and a film of a completely fluorinated ethylene-propylene copolymer, the later film having one surface rendered cementable, by bringing together one surface of said polyimide film and said cementable surface of said fluorinated ethylene-propylene film under pressure and with the application of heat.

3,791,910

MULTIPLE GLAZED UNIT

George H. Bowser, New Kensington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 49,779, June 25, 1970, abandoned. This application Mar. 7, 1972, Ser. No. 232,411
Int. Cl. E06b *3/66*
U.S. Cl. 161—45 12 Claims

Disclosed herein is a room temperature vulcanizable mastic for hermetically sealing multiple glazed units. Also disclosed is a dehydrator element for a multiple glazed unit comprising a desiccant material dispersed in a matrix of moisture vapor transmittable material.

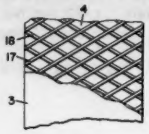
3,791,911

ADHESIVE FREE FIBER REINFORCED LAMINATE

Luther L. Yaeger, and Wei-Gwo Chen, both of Houston, Tex., assignors to Griffolyn Company, Incorporated, Houston, Tex.

Continuation of Ser. No. 871,916, Oct. 28, 1969, abandoned. This application Feb. 23, 1972, Ser. No. 228,783
Int. Cl. B32b *5/12*
U.S. Cl. 161—58 11 Claims

By very rapid and precise electronic controlled heat application, with conditions held between specified critical limits, Applicants have succeeded in producing reinforced laminates without the use of adhesives, and yet retaining the capacity of



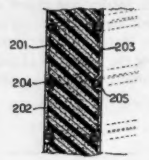
the reinforcements to move controllably in response to stresses so as to present maximal tear resistance.

3,791,912

CONSTRUCTION MEMBER

Francois Allard, 34, Avenue Leclere, Douai, France

Filed July 16, 1971, Ser. No. 163,297
Claims priority, application France, July 22, 1970, 70.27047; Jan. 15, 1971, 71.01277
Int. Cl. B32b *3/26, 5/18, 5/24*
U.S. Cl. 161—160 18 Claims



A construction member comprising a core of plastic foam or expanded plastic material, a covering of plastics resin reinforced with glass fibres bonded to the faces of the core, reinforcing rods being disposed at the connection of the covering with the core such that upon hardening of the resin the reinforcing rods are tightly bonded to the core as well as the covering. The construction member may be formed as a panel, paving slab, flooring member, telephone pole, or silo depending on the desired use.

3,791,913

FREE FLOWING ELASTOMER PELLETS AND PROCESS FOR THEIR PREPARATION

Gary Ver Strate, Matawan, and Edward N. Kresge, Watchung, both of N.J., assignors to Esso Research and Engineering Company, Linden, N.J.

Filed May 17, 1971, Ser. No. 144,300
Int. Cl. B32b *33/00*
U.S. Cl. 161—164 9 Claims

Free flowing pellets of substantially unvulcanized elastomeric polymers having a cured surface are prepared by exposing the pellets to a curing medium for said elastomer for sufficient time to allow vulcanization of the exterior portions of the pellet; i.e., so that the pellet is cured to a maximum depth of about one-tenth of the diameter of its smallest dimension.

3,791,914

LAMINATED GLASS ARTICLES

Vernon G. Ammons, Glenshaw, and Michael E. Dufala, Tarentum, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 117,164, Feb. 19, 1971, abandoned, which is a continuation of Ser. No. 645,881, June 14, 1967, abandoned. This application Jan. 26, 1972, Ser. No. 221,083

Int. Cl. B32b *27/40, 17/10*

U.S. Cl. 161—190 **18 Claims**

This invention relates to polyurethane resins having reduced adhesion to other materials. It particularly pertains to polyurethane interlayers, especially interlayers utilized in laminated safety glass articles. More particularly, this invention relates to polyurethane compositions comprising the reaction product of an organic polyisocyanate and an organic polyol which has reduced adhesion to other materials due to the inclusion therein of a proton containing compound of phosphorus, preferably acid organic phosphorus compounds.

3,791,915

MULTILAYER LAMINATED POLYETHYLENE COPOLYMER-POLYAMIDE FILM

Clifford Clayton Goehring, Princeton; Arthur Clifford Hart, Jr., Chester, and Derek Wooldridge, Princeton, all of N.J., assignors to American Can Company, Greenwich, Conn.

Filed July 6, 1971, Ser. No. 160,145

Int. Cl. B32b *27/34, 27/08*

U.S. Cl. 161—227 **8 Claims**

A heat sealable laminated film including at least a layer of a polyamide polymer, a layer of a blend of polyethylene and a zinc-neutralized ionic copolymer, and an adherent layer of a zinc-neutralized ionic copolymer of ethylene and an α,β-ethylenically unsaturated carboxylic acid. Preferred respective materials are polycaproamide and a zinc-neutralized ionic copolymer of ethylene and methacrylic acid.

3,791,916

SEALING POLYSTYRENE

Frank E. Eastes, Spartanburg, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Filed Dec. 6, 1971, Ser. No. 205,394

Int. Cl. B32b *27/06;* **B65d** *5/42*

U.S. Cl. 161—247 **5 Claims**

Two polystyrene surfaces may be sealed together with a fusion type seal at a temperature below the melting point or distortion temperatures of the polystyrene by coating the polystyrene with a selected material that causes the polystyrene to seal in such a manner at a temperature between room temperature and the melting temperature of the polystyrene. A new article is formed having two layers of polystyrene separated by a layer of polystyrene with a selected material dispersed therein. In some species the medial layer is stronger than the adjacent polystyrene layers and in others, the seals will open along the seal line when opening stress is applied to the article.

3,791,917

PROCESS FOR PRODUCING KRAFT PAPER LAMINATE OF TOP STOCK AND BASE STOCK LAYERS

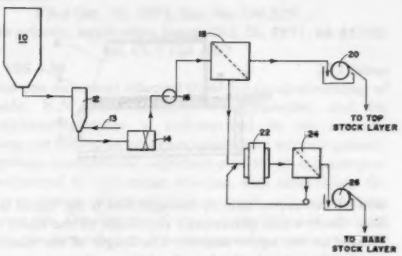
Joseph A. Bolton, III, North Attleboro, Mass., assignor to Bird Machine Company, Inc., South Walpole, Mass.

Filed Mar. 7, 1973, Ser. No. 338,826

Int. Cl. D21h *5/00, 1/02*

U.S. Cl. 162—55 **8 Claims**

A process is disclosed for producing kraft paper laminate of top stock and base stock layers from kraft fiber slurry digested to high yield, wherein the digested slurry is subjected to fine screening to separate from about 10% to about 30 percent of its fiber, substantially all of the separated fibers being suitable for top stock, and forming the top stock and bottom stock layers of the laminate respectively from the so separated fibers and the remaining fibers of the slurry.



3,791,918

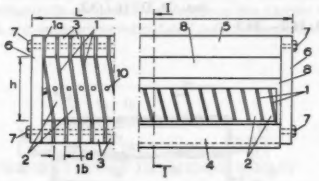
HEADBOX OF A PAPER MAKING MACHINE HAVING MULTIPLE, VERTICALLY INCLINED VANES

Jouni Koskimies, and Kauko Heinanen, both of Jyvaskyla, Finland, assignors to Valmet Oy, Helsinki, Finland

Filed Mar. 8, 1972, Ser. No. 232,739

Int. Cl. D21f *1/02, 1/06*

U.S. Cl. 162—343 **7 Claims**



In a headbox of a paper making machine flow resistance is used to provide a pressure drop required for rendering uniform the flow velocity profile and for homogenizing paper pulp slurry. The flow resistance is produced by employing vanes extending parallel to the flow and dividing the headbox into flow channels having a small cross sectional area and a large friction surface area. The invention is particularly characterized in that the vanes are inclined in relation to a vertical plane and have vertical extensions. The vanes are spaced apart a distance such that the height of each flow channel is substantially greater than the width.

3,791,919

CONTINUOUS VACUUM FILTER

Wolfgang Schuller, Wertheim, and Karl Veeh, Haslock, both of Germany, assignors to Glaswerk Schuller GmbH, Faserweg, Wertheim/Main, Germany

Filed Oct. 18, 1971, Ser. No. 189,850

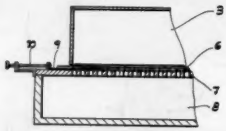
Claims priority, application Germany, Oct. 17, 1970, 2051048

Int. Cl. D21f *1/58, 1/52*

U.S. Cl. 162—353 **6 Claims**

A continuous vacuum filter wherein the outlet of a feeding unit discharges a wide stream of a suspension of fibrous particles in a liquid carrier onto the upper stretch of an endless belt-like foraminous screen so that the liquid carrier passes through the interstices of the screen and the fibrous particles

accumulate on the upper stretch to form thereon a sheet. The width of such sheet can be varied by two impermeable masks which overlap the marginal portions of the upper stretch and are movable toward and away from each other below the outlet of the feeding unit to thus determine the width of that portion of the upper stretch through which the liquid is free to flow. Such width determines the width of the sheet which is formed on the upper stretch. The length of the masks equals or slightly exceeds the length of the outlet, as considered in the direction of lengthwise movement of the upper stretch.



3,791,920

SUCTION BOX ARRANGEMENT FOR PAPERMAKING MACHINE HAVING PARTITION WALL BETWEEN THE TOP AND BOTTOM

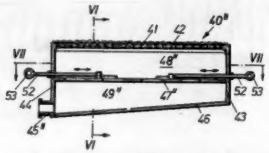
Henrik Nisser, Korsnas, Sweden; Jakob Wolf, Heidenheim/Brenz, Germany; Werner A. Schoen, Ridley Park, Pa., and Ernst Albert Schoffmann, Heidenheim/Brenz, Germany, assignors to J. M. Voith GmbH, Heidenheim/Brenz, Germany

Filed May 27, 1971, Ser. No. 147,401

Claims priority, application Germany, June 13, 1970, 2029212

Int. Cl. D21f *1/52*

U.S. Cl. 162—363 **9 Claims**



A partition wall located between the top and bottom walls of a suction box has one or more apertures therein which can be controlled as to size by mask elements which are disposed on the top of the partition wall. The mask elements can be slidably moved by rods which extend through the side walls of the suction box to adjust the positioning of the mask elements in a direction parallel to the plane of the partition wall. The mask elements may be, for example, rectangular or trapezoidal in shape, and may be mounted in flexible or swivelable fashion.

3,791,921

METHOD OF BREEDING FISSILE FUEL IN A COUPLED NUCLEAR REACTOR

Richard Myles Stanton, Canton, Mass., assignor to Research Corporation, New York, N.Y.

Continuation of Ser. No. 858,851, Sept. 17, 1969. This application Mar. 10, 1972, Ser. No. 233,824

Int. Cl. G21c *1/00*

U.S. Cl. 176—17 **10 Claims**

A nuclear fuel for incorporation into the fast region of a coupled nuclear reactor to provide power and breeding of additional fissile fuel comprising a heterogeneous mixture or grouping of a fertile material with lithium and an isotope of hydrogen. The absorption of thermal neutrons by the lithium-6 isotope in the lithium causes the isotope to break up into helium (He^4), and tritons (H^3) with an energy of about 2.8 MeV. The fusing of the tritons, so produced, with the hydrogen isotope, which may be in the form of deuterium or tritium, forms further helium and releases fusion neutrons with energies in the range from 10 to 20 MeV. The latter high energy neutrons produce direct fission of the fertile material, e. g., U^{238} or Th^{232}, releasing about 3.5 neutrons per fission and 200 MeV. energy. The heat produced by these reactions may be used for power and the remaining fertile material is rendered fissile by final neutron capture, thus breeding additional fissile fuel.

3,791,922

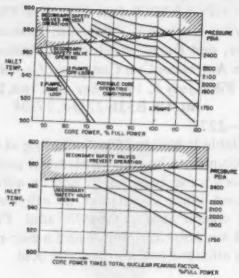
THERMAL MARGIN PROTECTION SYSTEM FOR A NUCLEAR REACTOR

Charles R. Musick, Rockville, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Nov. 23, 1970, Ser. No. 91,808

Int. Cl. B21c *7/32*

U.S. Cl. 176—20 **26 Claims**



A thermal margin protection system for a nuclear reactor wherein the coolant low flow trip point and the calculated thermal margin trip point are switched simultaneously and the thermal limit locus is made more restrictive as the allowable flow rate is decreased. The invention is characterized by calculation of the thermal limit locus in response to applied signals which accurately represent reactor cold leg temperature and core power; cold leg temperature being corrected for stratification before being utilized and reactor power signals commensurate with power as a function of measured neutron flux and thermal energy added to the coolant being auctioneered to select the more conservative measure of power. The invention further comprises the compensation of the selected core power signal for the effects of core radial peaking factor under maximum coolant flow conditions.

3,791,923

RECUPERATIVE THERMAL RECOMBINING SYSTEM FOR HANDLING LOSS OF REACTOR COOLANT

Andrew Tej Bhan, Bridgeport, Conn., assignor to Universal Oil Products Company, Des Plaines, Ill.

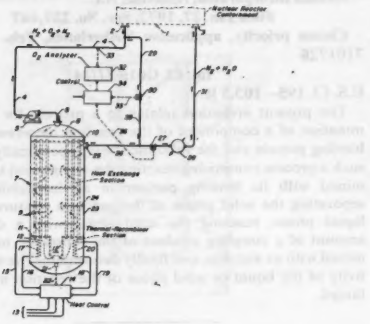
Filed Jan. 10, 1972, Ser. No. 216,714

Int. Cl. G21c *19/32*

U.S. Cl. 176—37 **10 Claims**

A recycle loop method and recuperative heating system is provided for thermally recombining hydrogen and oxygen, such as may be desired in connection with a dissociated gas stream from a containment vessel for a nuclear reactor under loss of coolant accident conditions. The dissociated charge stream is preferably heated by indirect heat exchange with a resulting water vapor containing combined stream to effect heat conservation and, also preferably, the recuperative heat

exchange operation and the high temperature recombining reaction are carried out in a unitary zone incorporating electrical, non-flame, heat input means. The feature of having recycle of a portion of the resulting combined stream into admixture with the hydrogen-oxygen containing charge stream is carried out and regulated responsive to an oxygen analysis and oxygen content measured in the stream at a point ahead of the recombiner zone.



3,791,924

BIOLOGICAL METHOD OF PRODUCING PHENOLIC AMINO ACIDS

Koichi Ogata, Osaka; Hideake Yamada; Hitoshi Enei, both of Kanagawa, and Shinji Okumura, Tokyo, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 879,934, Nov. 25, 1969, abandoned. This application Oct. 13, 1971, Ser. No. 188,991

Claims priority, application Japan, Dec. 2, 1968, 43-88261; Oct. 21, 1970, 45-92658; Nov. 2, 1970, 45-96703; Dec. 30, 1970, 45-1281713

Int. Cl. C12d *13/06*

U.S. Cl. 195—29 **16 Claims**

3, 4-Dihydroxyphenyl-L-alanine, L-tyrosine and 2, 4-dihydroxyphenyl-L-alanine are obtained by the action of β-tyrosinase produced by cultivation of certain microorganisms, on catechol, phenol and resorcin, and cysteine, cystine, serine and alanine, or ammonia and pyruvic acid, oxalacetic acid, fumaric acid, malic acid, maleic acid, maleic oxime, glyoxylic acid, lactic acid or these derivatives.

3,791,925

PROCESS FOR PRODUCING L-HISTIDINE

Kiyoshi Nakayama, Sagamihara, and Kazumi Araki, Tokyo, both of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed May 6, 1971, Ser. No. 141,025

Claims priority, application Japan, May 20, 1970, 45/42408. The portion of the term of this patent subsequent to Jan. 30, 1990, has been disclaimed.

Int. Cl. C12b *1/00*

U.S. Cl. 195—29 **4 Claims**

L-histidine is produced by fermentation of an aqueous nutrient media, wherein the ratio of the nitrogen source to the carbon source is at least 5:100, with organisms of the genera *Brevibacterium*, *Corynebacterium*, *Arthrobacter*, *Micrococcus*, *Bacillus*, *Nocardia* and *Microbacterium*.

3,791,926

PROCESS FOR THE PRODUCTION OF L-ASPARTIC ACID

Ichiro Chibata, Osaka; Tetsuya Tosa, Kyoto, and Tadashi Sato, Osaka, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Oct. 18, 1972, Ser. No. 298,529

Claims priority, application Japan, Oct. 28, 1971, 46-85778

Int. Cl. C12d *1/02*

U.S. Cl. 195—30 **33 Claims**

At least one monomer selected from the group consisting of acrylamide, N,N'-lower alkylene-bis(acrylamide) and bis (acrylamidomethyl)ether is polymerized in an aqueous suspension containing an aspartase-producing microorganism. The resultant immobilized aspartase-producing microorganism is subjected to enzymatic reaction with ammonium fumarate or a mixture of fumaric acid or its salt and an inorganic ammonium salt. Divalent metal ion is preferably added to the anzymatic reaction solution. L-aspartic acid is produced.

3,791,927

ENTRAPPED CARRIER BOUND ENZYMES

Peter Salvatore Forgione, Stamford, Conn.; Rocco Alberto Polistina, Port Chester, N.Y., and Edward Emil Schmitt, Norwalk, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed July 14, 1971, Ser. No. 162,699

Int. Cl. C07g *7/02*

U.S. Cl. 195—63 **10 Claims**

The catalytic activity of carrier bound enzymes is maintained and the channelling and compacting of the bound enzyme is substantially reduced by entrapping the carrier bound enzyme in a self-supporting reliculated cellular material.

3,791,928

PURIFICATION OF THYMIDINE KINASE

Wolfgang Rohde, Bovenden, and Axel Lezius, Gottingen, both of Germany, assignors to Max-Planck-Gesellschaft Zur Forderung Der Wissenschaften e.V., Gottingen, Germany

Filed May 28, 1971, Ser. No. 148,189

Claims priority, application Germany, June 10, 1970, 2028588

Int. Cl. C07g *7/02*

U.S. Cl. 195—66 R **6 Claims**

Purified thymidine kinase is recovered from its contaminated aqueous solutions by adsorption on cross-linked dextran of chromatographic grade activated with bromine cyanide and coupled with 3'- or 5'-aminothymidine or its N-aminoalkyl derivatives, followed by elution with dilute sodium chloride solution at pH 8.

3,791,929

PHOSPHATASE ASSAY USING LYOPHILIZED ARYL PHOSPHATE MONESTERS

Frank E. Hammer, Chicago, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 856,205, Sept. 8, 1968, Pat. No. 3,723,579. This application Nov. 13, 1972, Ser. No. 306,033

Int. Cl. G01n *31/14*

U.S. Cl. 195—103.5 R **4 Claims**

Lyophilized aryl phosphate monoesters having a pH of substantially 1 to 4 upon reconstitution with the amount of water

removed during lyophilization; are prepared by lyophilizing an aqueous solution of the aryl phosphate monoesters having a pH of substantially 1 to 4. Diagnostic compositions for the determination of phosphates in which the lyophilized aryl phosphate monoesters are employed.

3,791,930

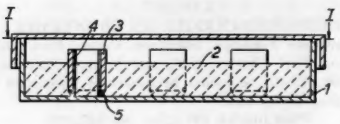
SUPPORTING ELEMENT AND ASSOCIATED METHOD OF USE IN MICROBIOLOGICAL, SEROLOGICAL, IMMUNOLOGICAL, CLINICAL-CHEMICAL AND SIMILAR LABORATORY WORK

Rolf Saxholm, Aastadveien 2, Billingstad, Norway

Filed May 1, 1970, Ser. No. 33,594

Int. Cl. C12k *1/00*

U.S. Cl. 195—103.5 R **16 Claims**



For microbiological and other laboratory work in which supporting elements carrying an active substance is brought into contact with a substrate there is provided a supporting element of tubular or other shape and adapted to be forced through the substrate to the bottom of the same and thereby wholly or partly to confine an area of the substrate. The element carries the active substance on the side facing the confined area and isolates it from the substrate on the opposite side. The supporting element may comprise magnetic material and be pulled to the bottom of the substrate by magnetic force.

3,791,931

REAGENT AND METHOD FOR DETERMINATION OF LACTATE DEHYDROGENASE

Waldemar Thum, Tutzing; August Wilhelm Wahlefeld, Weilheim; Gotthilf Naher, Tutzing; Wolfgang Gruber, Garatshausen; Hans Mollering, Tutzing; Gunter Weimann, Percha, and Hans Ulrich Bergmeyer, Tutzing, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Germany

Filed Nov. 30, 1971, Ser. No. 203,446

Claims priority, application Germany, Dec. 16, 1970, P 20 61 984.5

Int. Cl. G01n *31/14*

U.S. Cl. 195—103.5 R **8 Claims**

Lactate dehydrogenase is quickly and reliably determined by means of a color test by contacting the test composition with the reagent comprising serum albumin, pig's heart diaphorase and nicotinamide-adenine-dinucleotide, wherein the diaphorase is preferably obtained from the protein fraction of pig's heart insoluble in 1.6 to 2.8M ammonium sulphate by treatment with 0.1 to 0.3 percent weight/volume polyethyleneimine, heating at 70° to 80° C., adsorption on a weakly acidic cation exchanger and subsequent elution.

3,791,932

PROCESS FOR THE DEMONSTRATION AND DETERMINATION OF REACTION COMPONENTS HAVING SPECIFIC BINDING AFFINITY FOR EACH OTHER

Antonius Hermanus Wilhelmus Maria Schuurs, and Bauke Klaas Van Weemen, both of Oss, Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Jan. 27, 1972, Ser. No. 221,447

Claims priority, application Netherlands, Feb. 10, 1971, 7101728

Int. Cl. G01n *31/14*

U.S. Cl. 195—103.5 R **4 Claims**

The present invention relates to a process for the determination of a component of the reaction between a specific binding protein and the substance being specifically bound by such a protein comprising reacting the component to be determined with its binding partner in an insolubilized form, separating the solid phase of the reaction mixture from the liquid phase, reacting the solid phase with a determined amount of a coupling product of the substance to be determined with an enzyme, and finally determining the enzyme activity of the liquid or solid phase of the reaction mixture obtained.

3,791,933

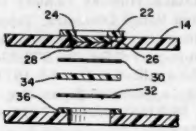
RAPID METHODS FOR ASSAY OF ENZYME SUBSTRATES AND METABOLITES

Rudolph H. Moyer, W. Covina, and Donald J. Sibbett, Cucamonga, both of Calif., assignors to Geomet, Incorporated, Rockville, Md.

Filed Feb. 25, 1971, Ser. No. 118,903. The portion of the term of this patent subsequent to Apr. 16, 1989, has been disclaimed.

Int. Cl. C12k *31/14*

U.S. Cl. 195—127 **11 Claims**



Method and apparatus for quantitating the amounts of enzyme substrates and metabolites present in biological fluids using spot test techniques. The tests utilize both fixed, preselected color standards and substrate and metabolite standards freeze-dried on transparent membranes or in porous pads for comparison. Other reagents including enzymes, dyes, cofactors are also freeze-dried in absorbent pads. The assembly may utilize any or all of the following in various combinations: porous discs of materials such as glass fibre filters to store reagents, to serve as liquid reaction volume measurement, and to assist in removing cells from blood samples; microporous membranes to act as barriers to blood cells; a protein enrichment membrane or a dialysis membrane to restrict passage of large molecules to the indicator zone; and a transparent window which may be a second microporous membrane or impermeable plastic on which indicator dyes are dried. In assembled format, the test plates, slides or discs fulfill all requirements for conducting the selected test: no added instrumentation, controls or other measurements are required.

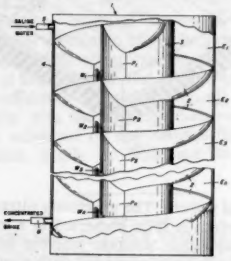
These test devices may assist in the diagnosis of a number of pathological conditions which give rise to abnormal levels of metabolites or enzyme substrates. Methods for rapid assay of serum cholestrol, uric acid, testosterone, androsterone and galactose have been indicated as examples. A wide variety of other compounds found in biological fluids may also be assayed by similar technology.

3,791,934

HELICAL MULTISTAGE FLASH DISTILLATION UNIT

Richard N. Webb, Wilmington, Del., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Aug. 9, 1971, Ser. No. 173,332
Int. Cl. B01d 3/02, 3/06
U.S. Cl. 202—173 2 Claims



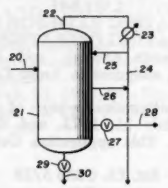
A continuous, downwardly spiralling multistage flash evaporator passage. The condensing stages, one above the other, are provided in the core around which the evaporator passage winds.

3,791,935

PURIFICATION OF CARBOXYLIC ACIDS

Lloyd S. Eubanks and John T. Payne, Texas City, Tex., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 10, 1971, Ser. No. 197,433
Int. Cl. C07c 51/42
U.S. Cl. 203—74 18 Claims



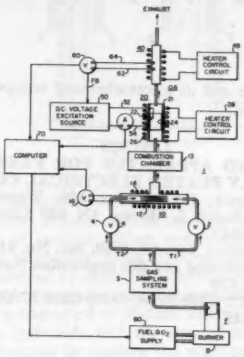
A process for the removal of halogen contaminants and the drying of aqueous monocarboxylic acids, particularly those produced by the reaction of an alcohol or olefin and carbon monoxide in the presence of the catalytic system comprising a Group VIII metal component and a halogen component containing bromine or iodine and at least a portion of the halogen component being either an alkyl halide and/or a hydrogen halide. The process comprises introducing a monocarboxylic acid stream containing water and the halogen contaminant into the upper half of a distillation column, removing an overhead fraction consisting primarily of the water and alkyl halide charged to said column, removing a stream from the middle portion of said column containing a major proportion of hydrogen halide present in said column, and removing a product acid stream from at or near the bottom of said column, the product acid stream being essentially dry and substantially free of the halogen contaminants charged to said column. The method is particularly applicable to the removal of water and iodine-containing compounds from acetic and propionic acids.

3,791,936

METHOD AND APPARATUS FOR MONITORING THE TOTAL COMBUSTIBLES AND OXYGEN CONTENT OF A GAS

Alfred Pebler and William M. Hickam, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 20, 1971, Ser. No. 173,490
Int. Cl. G01n 27/46
U.S. Cl. 204—1 T 5 Claims



The invention pertains to a technique for monitoring both the oxygen and combustibles content of a gas mixture regardless of excess oxygen or excess fuel conditions. The technique comprises the utilization of a catalytic combustion sensor and a solid electrolyte oxygen cell assembly. A catalytic thermopile sensing element causes a reaction to occur between the oxygen and combustible constituents of the gas mixture resulting in depletion of the constituent of lesser quantity and generating an electrical indication of the quantity of the minor constituent. The gaseous mixture is subsequently monitored by the solid electrolyte oxygen cell assembly, which generates an electrical output signal indicative of the excess oxygen or excess combustibles remaining in the gas mixture after the reaction produced by the catalytic thermopile sensing element. Under excess fuel conditions, the solid electrolyte oxygen cell assembly generates a signal which functions to introduce oxygen into the gas mixture in an amount to insure complete combustion. Manipulation of the electrical output signal from the catalytic thermopile sensing element and the electrical output signal of the solid electrolyte oxygen cell assembly by suitable monitoring circuitry provides electrical output signals indicative of both the oxygen and combustibles content in the original gas mixture.

3,791,937

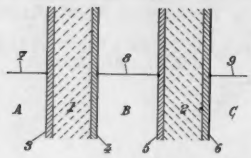
METHOD AND DEVICE FOR REGULATING THE CONTENT IN A GASEOUS MIXTURE OF A GIVEN PURE GAS, ESPECIALLY OXYGEN

Jean Besson, Montfleury, Michael Bonnat, Grenoble, Charles Deportes, Brignoud, and Michel Kleitz, Grenoble, France, assignors to Agence Nationale de Valorisation de la Recherche (Anvar), Paris, France

Filed Oct. 22, 1971, Ser. No. 191,723
Claims priority, application France, Oct. 23, 1970, 7038365
Int. Cl. G01n 27/46
U.S. Cl. 204—1 R 9 Claims

Between the gaseous mixture and the reference atmosphere, here the external atmosphere, there is provided a protecting atmosphere of composition close to that of the gaseous mixture. Use is made of the ionic conductive properties of solid electrolytes. The invention is especially

useful for oxygen pumps and gauges and enables interfering leakages due to the physical permeability of the solid electrolyte and its electrochemical semipermeability, to be eliminated.



3,791,938

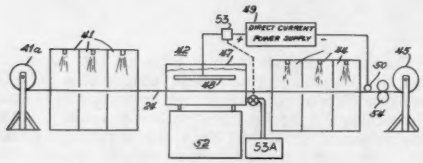
METHOD AND APPARATUS FOR FABRICATING SELECTIVELY PLATED ELECTRICAL CONTACTS

Robert M. Healy, Rte. 2, Box 359, Warrenville, Ill. 60555, and Ralph J. Hovey, 1N 600 Glenrise, Glen Ellyn, Ill. 60137

Original application Apr. 14, 1969, Ser. No. 815,609, now abandoned. Divided and this application Nov. 22, 1971, Ser. No. 201,239

Int. Cl. C23b *5/48, 5/58;* **C23f** *17/00*

U.S. Cl. 204—15 **5 Claims**



A method and apparatus for making electrical contact members from a continuous sheet or tape of electrically conductive material, the members being provided with precisely located plated wear areas adapted to establish electrical connection with a mating contact. Apparatus is provided for indexing the tape with longitudinally spaced apart locating pilots, and for coating the tape with a resist material in a manner to define precisely located non-coated areas thereon, the non-coated areas corresponding to the wear areas of the contacts. Thereafter, the tape is subject to a selective plating process which plates only the non-coated wear areas with a layer of noble metal. Cleaning apparatus is provided for removing the resist material from the tape, and apparatus is provided for punching and forming the contacts from the tape, the apparatus being operative to precisely fix the plated wear areas of the contacts with respect to the indexing pilots. In this manner, each of the contacts formed is provided with a precisely located plated wear area.

3,791,939

METHOD OF SELECTIVELY DEPOSITING A METAL ON A SURFACE

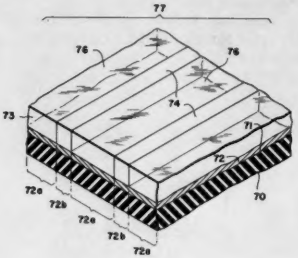
Anne Marie Ferrara, Princeton Township, Mercer County, and John Thomas Kenney, Lawrence Township, Mercer County, N.J., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed May 15, 1972, Ser. No. 252,995

Int. Cl. C23b *5/64;* **C23c** *3/02*

U.S. Cl. 204—15 **12 Claims**

A method of depositing a metal pattern on a surface of a substrate is disclosed. A surface of the substrate is sensitized with a photosensitive sensitizer selected from the group of sensitizers comprising a photosensitive gold sensitizer and a photosensitive platinum sensitizer. The sensitized surface is exposed to a source of ultraviolet radiation to delineate an unexposed pattern corresponding to the desired metal pattern. The selectively ultraviolet radiation-exposed surface is then immersed in a suitable electroless metal deposition solution wherein an electroless metal is catalytically reduced on the delineated unexposed pattern.



3,791,940

PROCESS FOR SEALING ANODIZED ALUMINUM

Andrew Alexander, Toledo, Ohio, assignor to Aluminum Company of America, Pittsburgh, Pa.

No Drawing. Continuation of abandoned application Ser. No. 49,944, June 25, 1970. This application May 12, 1972, Ser. No. 252,768

Int. Cl. C23c *7/00;* **C23f** *17/00*

U.S. Cl. 204—35 N **8 Claims**

Improving an anodic oxide coating on aluminum by sealing with an aqueous hydrolyzable metallic salt and then treating with at least one aqueous mineral acid to remove smudge formed during sealing.

3,791,941

GOLD PLATING BATH FOR BARREL PLATING OPERATIONS

Maurice Bick, South Orange, and Jean A. Lochet, Metuchen, N.J., assignors to Auric Corporation, Newark, N.J.

No Drawing. Continuation-in-part of applications Ser. No. 273,860, July 21, 1972, and Ser. No. 288,020, Sept. 11, 1972. This application Oct. 13, 1972, Ser. No. 297,288

Int. Cl. C23b *5/28*

U.S. Cl. 204—46 **14 Claims**

An electroplating bath particularly suited for barrel plating operations. The bath includes in addition to an alkali-gold cyanide, a bath soluble salt of N,N-di-2-hydroxyethylglycine or of glycine, or glycine itself may be utilized. The bath further includes quantities of hydrazine, small amounts of arsenic and/or lead ion, and a buffering agent such as phosphate ion.

3,791,942

PROTECTIVE COATING FOR MAGNESIUM

William McNeill, Southampton, Pa., assignor to Duromag Coatings Inc., Philadelphia, Pa.

No Drawing. Filed Sept. 21, 1972, Ser. No. 291,108

Int. Cl. C23b *9/06*

U.S. Cl. 204—56 M **10 Claims**

A method of producing hard protective black coatings on magnesium and magnesium base alloys. The method includes making the magnesium articles the electrodes and electrolytically treating them under progressively increasing potential in an aqueous solution comprising a chromate, a vanadate, a phosphate and a fluoride. The pH of the solution is maintained within a range of about 5.5 to about 9 with an alkalinity agent yielding non-metallic cations only.

3,791,943
PROCESS FOR AFTER TREATMENT OF ANODIC OXIDE OR CHEMICAL CONVERSION COATINGS OF ALUMINUM OR ALUMINUM ALLOYS

Ikuo Mita, Hiroyuki Kawamura, and Shiro Manaka, Tokyo, Japan, assignors to Tokyo Kaken Kogyo Co, Ltd., Tokyo, Japan

No Drawing. Filed Feb. 22, 1972, Ser. No. 228,295
Claims priority, application Japan, Sept. 8, 1971, 46/68,958
Int. Cl. C23b *11/02*
U.S. Cl. 204—56 14 Claims

Anodic oxide or chemical conversion coatings formed on aluminum or aluminum alloys in a conventional manner are subjected to electrolysis in an aqueous solution containing at least one of the compounds selected from the group consisting of calcium and magnesium salts as an electrolyte with use of electric current to produce a cement like substance on the coatings thereby forming a surface which excels in resistance to corrosion and staining.

3,791,944
PROCESS FOR THE POLYMERIZATION OF UNSATURATED COMPOUNDS

Raffaele Ercoli, Mauro Guainazzi, and Giuseppe Silvestri, Palermo, Italy, assignors to Snam Progetti S.p.A.

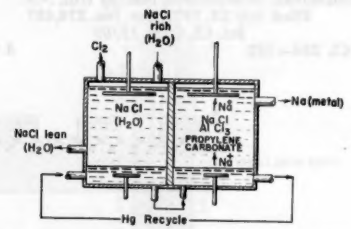
No Drawing. Filed May 12, 1972, Ser. No. 252,879
Claims priority, application Italy, May 13, 1971, 24,467/71
Int. Cl. C08f *1/28, 3/04*
U.S. Cl. 204—59 R 10 Claims

Alpha olefins are polymerized in an activated, anhydrous halogenated hydrocarbon. The anhydrous halogenated hydrocarbon is activated by passing through it an electric current using an aluminum or aluminum alloy anode. The alpha olefin is then passed into the activated halogenated hydrocarbon and polymerized.

3,791,945
METHOD OF PRODUCTION OF ALKALI METALS AND THEIR ALLOYS

Charles W. Tobias, Orinda, Calif., and Jacob Jorne, Southfield, Mich., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Feb. 22, 1973, Ser. No. 334,825
Int. Cl. C22d *1/02, 1/06*
U.S. Cl. 204—59 AM 10 Claims

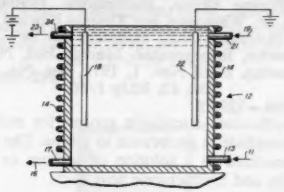


An impure amalgam of an alkali metal or mixture thereof is produced by electrolysis. The amalgam is then transferred to an electrolytic cell containing propylene carbonate with an appropriate salt (or salts) of the alkali metal (or metals), e.g. of ClO_4^-, BF_4^-, PF_6^-, Cl^-, Br^-, I^-, with or without added $AlCl_3$. Then, with appropriate voltage, current and other conditions, one or more selected alkali metals is anodically dissolved to yield a pure metal or selected metal mixture by electrodeposition.

3,791,946
RECOVERY OF SODIUM PERSULFATE SOLUTIONS

Robert L. Owens, Greensboro, N.C., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Jan. 16, 1973, Ser. No. 324,051
Int. Cl. C01b *15/08;* C23b *3/02*
U.S. Cl. 204—82 6 Claims

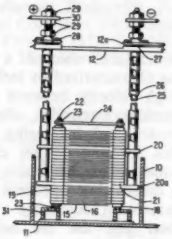


Sodium persulfate which is reusable for etching is recovered from a spent etching solution by lowering concentrations of sodium sulfate and metal sulfate in the solution to acceptable levels. The metal sulfate concentration is lowered by electrolysis thereby plating the metal from the solution and generating sulfuric acid. The sulfuric acid is converted to sodium sulfate by the addition of sodium hydroxide and the concentration of sodium sulfate is lowered by cooling the solution to −5 to +5 degrees centigrade thereby precipitating sodium sulfate from the solution. To lower the activity of the persulfate during plating, the solution is advantageously maintained at −5 to +5 degrees centigrade during plating thereby precipitating the sodium sulfate in two steps.

3,791,947
ELECTROLYTIC CELL ASSEMBLIES AND METHODS OF CHEMICAL PRODUCTION

Richard E. Loftfield, Chardon, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Jan. 26, 1972, Ser. No. 220,902
Int. Cl. C01b *11/26*
U.S. Cl. 204—95 5 Claims



Electrode assemblies and cells for electrolytic processes, including the production of alkali metal hypochlorite, alkali metal chlorate, and other inorganic and organic chemical products, comprise a diaphragm-less electrolytic cell having at least one assembly of a plurality of planar, parallel, closely spaced foraminous dimensionally stable substantially horizontally disposed anodes and a plurality of parallel foraminous cathodes substantially horizontally disposed, the cathodes interleaved with the anodes in substantially face-to-face closely spaced parallel alignment. Organic chemical products, alkali metal hypochlorite and alkali metal chlorate are produced by placing the assembly of electrodes provided with means for supplying current to the individual anodes and current from

the individual cathodes, in alkali metal halide solutions, solutions of organic electrolytes and electrolyzing the solutions while maintaining operating parameters suitable for the production of alkali metal hypochlorite and alkali metal chlorate and organic chemical products.

3,791,948

PREFERENTIAL ETCHING IN GaP

Richard Wayne Dixon, Morristown, William Harold Hackett, Jr., Whippany, and Thomas Edward McGahan, North Plainfield, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

No Drawing. Filed Nov. 1, 1971, Ser. No. 194,201

Int. Cl. B23p *1/00*

U.S. Cl. 204—129.75 **4 Claims**

The specification describes a process for etching n-type gallium phosphide in preference to p-type. The n-type material is anodized in a solution of sodium or potassium hypochlorite and hydrochloric acid.

3,791,949

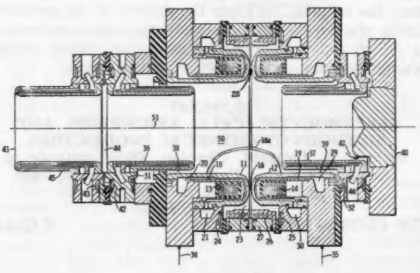
PROCESSES FOR CHEMICAL CONVERSION

Chikara Hirayama, Murrysville, and Maurice G. Fey, Turtle Creek, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of abandoned application Ser. No. 829,452, June 2, 1969. This application Dec. 9, 1971, Ser. No. 206,401

Int. Cl. C07b *29/06*; C07c *3/48*; C01b *21/20*

U.S. Cl. 204—171 **7 Claims**



A process for chemical conversion of a process gas into a desired product gas characterized by introducing a process gas at a very high velocity between a pair of longitudinally spaced annular electrodes, elongating an arc between the electrodes and increasing the turbulence within the electrodes forming an arc chamber so that the rate of recombination of the atoms, molecules, and free radicals of the disassociated process gas is increased by chemical recombination occurring at a higher percentage of the total gas, the arc being periodically elongated to a length where the arc voltage exceeds the breakdown voltage between the electrodes so that the gap between the electrodes breaks down, the arc is transferred to the gap, and the process of gap breakdown and arc elongation is repeated cyclically.

3,791,950

ELECTROPHORESIS METHOD

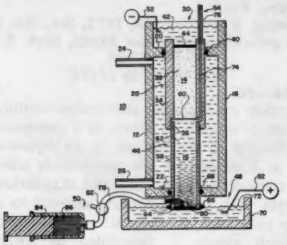
William B. Allington, Lincoln, Nebr., assignor to Instrumentation Specialties Company, Lincoln, Nebr.

Original application Feb. 14, 1972, Ser. No. 226,016. Divided and this application May 11, 1973, Ser. No. 357,561

Int. Cl. B01k *5/00*

U.S. Cl. 204—180 G **11 Claims**

To separate and collect different molecular species in a mixture of the species, the mixture is first electrophoresed in a gel such as a polyacrylamide gel to obtain good resolution of at least some of the different species and then electrophoresed into a collecting medium having bulk flow characteristics such as a density gradient column so



that the different species can be scanned and collected using techniques and apparatus that require bulk flow of the medium, with further electrophoresis in the collecting medium providing further separation.

3,791,951

METHOD OF MANUFACTURING A LAYER CONSISTING OF NONCONDUCTING PULVERULENT MATERIALS ON CURVED SURFACES

Norbert Ernst Fritz Hansen, Roetgen, and Walter Fritz Konrad Littmann, Eilderdorf, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

No Drawing. Filed Oct. 26, 1971, Ser. No. 192,572

Claims priority, application Germany, Oct. 28, 1970, P 20 52 916.2

Int. Cl. B01k *5/02*

U.S. Cl. 204—181 **2 Claims**

The invention relates to a method of manufacturing a layer of nonconducting pulverulent materials on bent surfaces by electrophoretic deposition from a dispersion in an apolar medium. Particularly the invention relates to such a method of manufacturing luminescent screens on concave surfaces of fibre-optical plates.

3,791,952

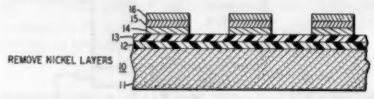
METHOD FOR NEUTRALIZING CHARGE IN SEMICONDUCTOR BODIES AND DIELECTRIC COATINGS INDUCED BY CATHODIC ETCHING

Edward Franklin Labuda, Allentown, and William Dennis Ryden, Whitehall, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 24, 1972, Ser. No. 274,487

Int. Cl. C23c *15/00*

U.S. Cl. 204—192 **4 Claims**

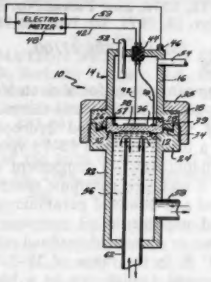


In the fabrication of semiconductor devices the masked backsputtering of metal layers to define metallization patterns results in a residual positive charge in underlying exposed dielectric films. This charge may deleteriously affect the operation of the resultant device structure. In accordance with this invention, this positive charge is controllably neutralized either by sputtering a thin metal film, for example, of nickel, over the entire surface or by otherwise depositing a thin metal film which then is exposed to a suitable source of radiation. The metal film then is removed conveniently by the same technique which removes the metal backsputtering mask.

3,791,953
SELF-SEALING ELECTROCHEMICAL OXYGEN METER

Bertram Minushkin, Greensburg, Pa., and George Kissel, Bayport, N.Y., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Oct. 31, 1972, Ser. No. 302,431
Int. Cl. G01n *27/46*
U.S. Cl. 204—195 S **5 Claims**

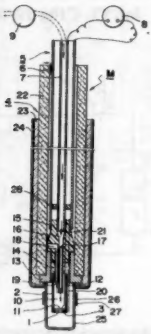


An electrolytic cell for measuring oxygen activity in liquid sodium in which the solid electrolyte is in the shape of a disc surrounded and supported by an annular spring seal, and incorporating features which provide an additional back-up seal, utilizing the product of chemical reactions between the fluids to be contained for forming a seal in situ.

3,791,954
DEVICE FOR MEASURING OXYGEN CONCENTRATION OF MOLTEN METAL

Makoto Noda, Nagoya, and Takeshi Kajita, Ohaza-Yuki, Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed July 21, 1971, Ser. No. 164,655
Claims priority, application Japan, Aug. 6, 1970, 45/68,293, 45/68,294; Oct. 23, 1970, 45/92,842; May 7, 1971, 46/36,504, 46/36,505
Int. Cl. G01n *27/46*
U.S. Cl. 204—195 S **7 Claims**

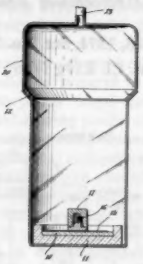


A device for measuring oxygen concentration of molten metal by using an oxygen concentration cell, wherein a solid electrolyte is directly or indirectly covered with a material to be carbonized in the molten metal, so that the element may be gradually heated before coming in contact with the molten metal. The electric connection of the solid electrolyte to an indicator may simultaneously be accomplished with its mechanical connection to a standard gas source. A specimen of the clean molten metal can be collected from substantially the same spot where the oxygen concentration is measured.

3,791,955
PREPARATION OF CHALCOGENIDE GLASS SPUTTERING TARGETS

Richard M. Klein, Framingham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 11, 1972, Ser. No. 313,740
Int. Cl. C23c *15/00*
U.S. Cl. 204—298 **3 Claims**

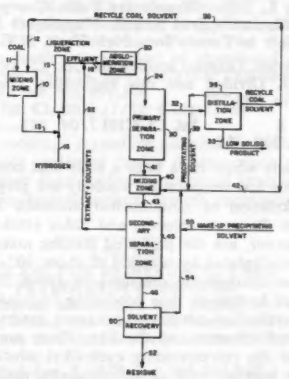


A method of preparing large area chalcogenide glass sputtering targets. These targets are prepared in an evacuated chamber or inert gas atmosphere by heating a boule of chalcogenide in a quartz dish to contour the bottom face of the target. While heating the boule, a weight forces a wire mesh with a stud attached into the top surface of the boule. After a predetermined time to insure good physical bond between glass and mesh, the chamber is cooled to ambient and the sputtering target (chalcogenide glass-mesh-stud) may be removed.

3,791,956
CONVERSION OF COAL TO CLEAN FUEL

Everett Gorin and Conrad J. Kulik, Pittsburgh, and Howard E. Lebowitz, Finleyville, Pa., assignors to Consolidation Coal Company, Pittsburgh, Pa.

Filed Feb. 16, 1973, Ser. No. 333,097
Int. Cl. C10g *1/00*
U.S. Cl. 208—8 **2 Claims**



Production of a low mineral content fuel by coal liquefaction processes which yield as their primary product a

mixture of liquid and solids, a part of which is suspended in the liquid. The suspended solids are effectively removed with minimum loss of desired product by means of a precipitating solvent which serves three functions, (1) to effect agglomeration of the suspended fines, (2) to prevent redispersal of the fines in the washing operation, and (3) to recover desired product from the rejected solids.

3,791,957

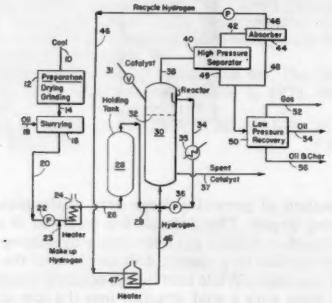
COAL HYDROGENATION USING PRETREATMENT REACTOR

Ronald H. Wolk, Lawrence Township, Trenton County, N.J., assignor to Hydrocarbon Research, Inc., New York, N.Y.

Filed Dec. 13, 1971, Ser. No. 207,231

Int. Cl. C10g *1/06*

U.S. Cl. 208—10 **7 Claims**



In the liquid phase catalytic hydrogenation of coal, improved operation is obtained by initially passing the pressurized and preheated coal-oil slurry containing relatively large coal particles through a pretreatment reactor, wherein the coal particles are partially dissolved to produce fine particles so that a better control of ebullation can be achieved in the final upflow catalytic reactor.

3,791,958

JET FUEL MANUFACTURE

Kenneth L. Dille, Wappingers Falls, George S. Saines, Fishkill, and Alfred Arkell, Wappingers Falls, N.Y., assignors to Texaco Inc., New York, N.Y.

No Drawing. Original application Oct. 13, 1971, Ser. No. 80,481. Divided and this application Nov. 6, 1972, Ser. No. 303,732

Int. Cl. C10l *1/04*

U.S. Cl. 208—15 **3 Claims**

Jet fuels which have both a high heat content and an acceptable low temperature viscosity are prepared by the hydroalkylation of mononuclear aromatic hydrocarbon fractions. Benzene, toluene, and Udex extract, and mixtures thereof, are the preferred starting materials. These are hydroalkylated by reaction at about 30°–250° C. under super-atmospheric pressures of about 20–70 atmospheres of hydrogen, thus producing hydroalkylates containing cycloalkyl-substituted benzenes, methylcyclohexyl-substituted toluenes and the like. These are further reduced to the corresponding cycloalkyl-substituted cyclohexanes, together with methylcyclohexyl methylcyclohexanes and methylcyclohexane when toluene is used, and the reduction products are adjusted to a final desired heat content and low temperature viscosity by stripping off or adding methylcyclohexane. The preferred catalyst is finely divided nickel on a support containing both a zeolite and a silica-alumina cracking catalyst.

3,791,959

BLENDED REFRIGERATION OIL COMPOSITION

Ivor W. Mills, Media, and John J. Melchiore, Wallingford, Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

No Drawing. Continuation-in-part of application Ser. No. 63,303, Aug. 12, 1970, now Patent No. 3,715,302. This application Nov. 18, 1971, Ser. No. 200,185

Int. Cl. C10g *41/00*

U.S. Cl. 208—19 **12 Claims**

A wide boiling range (e.g. for a given VGC) refrigeration oil, having good chemical and thermal stability and good miscibility with fluorinated hydrocarbon refrigerants, comprises a blend of from 50–75 volume percent of a hydrorefined naphthenic oil component and 50–25 volume percent of a wax free paraffinic component (such as a solvent refined and dewaxed paraffinic oil). Preferably, the hydrorefined naphthenic oil component (which can be a blend of two or more hydrorefined oils) has an SUS viscosity at 100° F. in the range of 75–750 SUS and the paraffinic component (which can be a blend) is chosen so that the resulting naphthenic-paraffinic blend has a viscosity at 100° F. in the range of 100–500 SUS (preferably 125–300 SUS, typically 150–250 SUS) and has a maximum natural floc point of −35° F. Preferably the blend contains less than 10 p.p.m. (more preferably less than 5) of basic nitrogen and contains in the range of 15–35 weight percent aromatics. The preferred paraffinic components include dewaxed paraffinic petroleum lubes, wax-free hydrogenated polyolefin oils, hydrocracked lubes and mixtures thereof.

3,791,960

ISOMERIZATION OF PARAFFIN HYDROCARBONS

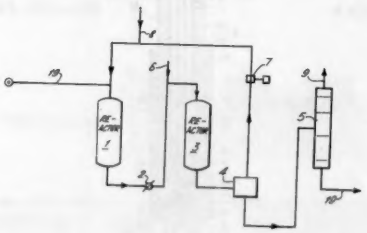
Owen Mansel Davies, Enfield, Martin Frederick Olive, Lightwater, Terence John Cook, Twickenham, and Graham Keith Hilder, Addlestone, England, assignors to The British Petroleum Company Limited, London, England

Filed Mar. 29, 1972, Ser. No. 239,232

Claims priority, application Great Britain, Apr. 19, 1971, 9,787/71; Aug. 10, 1971, 37,437/71

Int. Cl. C10g *39/00*

U.S. Cl. 208—57 **13 Claims**



A two stage hydrogenation-isomerization unit operating in the presence of a chloride activator has a common gas recycle system and the chloride activator is added between the hydrogenation and isomerization stages.

The hydrogenation stage operates at 150–350° C. and the isomerization stage at 100–204° C. but in any case below the hydrogenation stage. Both catalysts comprise a platinum group metal and chlorine or alumina. The isomerization catalyst preferably has from 8–15% wt. Cl; the

hydrogenation catalyst may have 6–8 %wt. Cl when functioning solely as a hydrogenation catalyst or 8–15% wt. chlorine when it functions as a combined hydrogenation/partial isomerization catalyst.

The pressures and hydrogen/hydrocarbon mole ratios are the same in both stages being preferably 20–75 bars gauge and 0.5 to 5:1. The space velocities in the two stages are preferably such that the ratios of catalyst are 6:1 to 3:1 vols. of catalyst in the isomerization zone/vol. of catalyst in the isomerization zone/vol. of catalyst in the combined hydrogenation/partial isomerization zone.

3,791,961

COMBINATION REFORMING PROCESS

John H. Sinfelt, Berkeley Heights, N.J., assignor to Esso Research and Engineering Company

No Drawing. Continuation-in-part of abandoned application Ser. No. 883,601, Dec. 9, 1969. This application Dec. 7, 1971, Ser. No. 205,729

The portion of the term of the patent subsequent to Dec. 14, 1988, has been disclaimed

Int. Cl. C10g *39/00*

U.S. Cl. 208—65 **27 Claims**

A conventional naphthene dehydrogenation catalyst, such as a platinum-halogen-alumina catalyst, is used in the initial zone or reactors in a catalytic reforming process; the tail zone or reactors contains a supported Group VIII polymetallic catalyst with platinum as one of the metallic components. In a preferred embodiment, the tail zone contains a platinum-iridium catalyst on a porous support such as alumina. In the tail reactors, conversion of paraffins is of primary importance, along with dealkylation of alkylbenzenes; in the initial reactors the predominant reaction is the conversion of naphthenes to aromatics. The combination process results in the formation of a significantly greater octane number product than is obtained in a conventional reforming process in which platinum-alumina catalyst is used throughout.

3,791,962

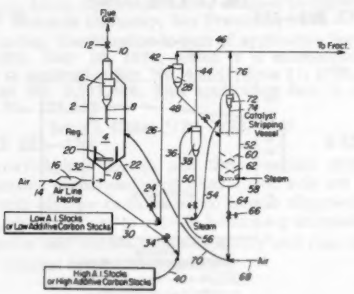
SELECTIVE CATALYTIC CRACKING WITH CRYSTALLINE ZEOLITES

Edward J. Demmel, Pitman, and Hartley Owen, Belle Mead, N.J., assignors to Mobil Oil Corporation

Filed Apr. 22, 1971, Ser. No. 136,452

Int. Cl. B01j *9/20;* **C10g** *37/02*

U.S. Cl. 208—80 **7 Claims**



The invention defined pertains to the catalytic cracking of hydrocarbon charge materials in a dual cracking system which segregates the charge on the basis of aromatic index (AI) rating before contact with a highly active and selective crystalline aluminosilicate cracking catalyst so that material having an AI rating below 15 will be converted under significantly different conditions from material having a higher AI rating.

3,791,963

HYDROTHERMAL METHOD FOR MANUFACTURING A NOVEL CATALYTIC MATERIAL, CATALYSTS CONTAINING SAID MATERIAL, AND PROCESSES USING SAID CATALYSTS

Joseph Jaffe, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Continuation-in-part of application Ser. No. 763,922, Sept. 30, 1968, now Patent No. 3,652,457. This application May 20, 1970, Ser. No. 39,173

The portion of the term of the patent subsequent to Mar. 28, 1989, has been disclaimed

Int. Cl. C10g *11/02;* **B01j** *11/40*

U.S. Cl. 208—111 **11 Claims**

(a) Method for manufacturing a novel catalytic material having a surface area above 200 square meters per gram, a bulk density below 0.85 grams per cc. and a particle density below 1.6 grams per cc., said catalytic material comprising a novel synthetic layered crystalline clay-type aluminosilicate mineral in an intimate admixture with an amorphous cogel comprising silica and alumina, said material being useful as a catalytic cracking catalyst and as a cracking component of a catalyst containing at least one additional component, said method comprising subjecting to autoclave conditions of elevated temperature and pressure a hydrogel or hyrogel slurry, said slurry comprising water, a component selected from fluorine and compounds of fluorine, and an amorphous cogel comprising oxides or hydroxides of silicon and aluminum, said silicon and aluminum preferably being present in said cogel in a silicon-to-aluminum atomic ratio above 1.65, said elevated temperature being in the range 340° to 700° F., for a time not more than any of the times ranging linearly from 36 hours at 340° F. to 6 hours at 700° F., whereby a substantial amount of said synthetic mineral is formed, in an intimate admixture with a substantial amount of unreacted amorphous cogel comprising compounds of silicon and aluminum, and drying said intimate admixture to produce said novel catalytic material; (b) the novel catalytic material so manufactured, comprising said synthetic mineral in said intimate admixture with unreacted amorphous cogel, preferably containing at least 10 weight percent of said unreacted amorphous cogel; (c) catalysts comprising said novel catalytic material; and (d) hydrocarbon conversion processes using said catalysts.

3,791,964

HYDROCARBON CONVERSION PROCESS EMPLOYING A CRYSTALLINE ALUMINOSILICATE AND METHOD OF PREPARING THE SAME

Guenter H. Kuehl, Morrisville, Pa., assignor to Mobil Oil Corporation

No Drawing. Continuation-in-part of application Ser. No. 523,936, Feb. 1, 1966, now Patent No. 3,386,801, which is a continuation-in-part of abandoned application Ser. No. 294,229, July 11, 1963. This application July 5, 1967, Ser. No. 651,108

Int. Cl. B01j *11/82;* **C10g** *11/04*

U.S. Cl. 208—120 **8 Claims**

As a new zeolite, a crystalline aluminosilicate having a crystal structure similar to zeolite A but a silica/alumina mol ratio higher than zeolite A, prepared from a mixed sodium tetramethylammonium system containing phosphate.

3,791,965

PROCESS FOR RE-REFINING USED PETROLEUM PRODUCTS

Ogden Fitzsimons, Kimberton, Pa., Charles O. Radden, Westwood, Mass., and George J. Hindman, Pottstown, Pa., assignors to Petrocon Corporation, Valley Forge, Pa.

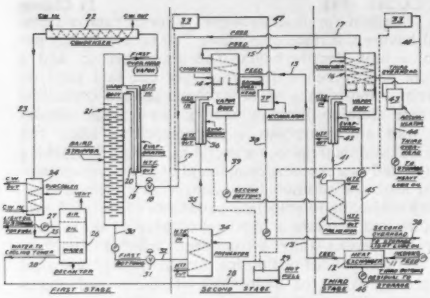
Filed Apr. 7, 1972, Ser. No. 241,985

Int. Cl. C10m *11/00*

U.S. Cl. 208—179 **20 Claims**

An ecologically clean process for recovering a valuable light hydrocarbon fuel, one or more lube stocks and an

asphalt-like residue, is described in which the raw feed stock consisting of accumulated used petroleum products is first heated by indirect heat exchange in the process itself and then subjected to a first stage stripping operation at atmospheric pressure and a temperature in the range from about 300 to 450° F. to remove the light hydrocarbon, water and volatile contaminants as an overhead and leaving a first bottoms, heating the first bottoms further and subjecting it to one or more additional flash distillations at a pressure in the range from about 1 to 40 torr (mm. Hg absolute) at a temperature in the range from about 590 to about 750° F. to separate one or more lube oil products and leave an asphalt-like residue. The light hydrocarbon product may be used in the process as fuel or sold. The stripped contaminated water is recycled for cooling purposes and either periodically incinerated, or a bleed stream is taken off and continuously incinerated to convert the contaminants to innocuous flue gases.



3,791,966

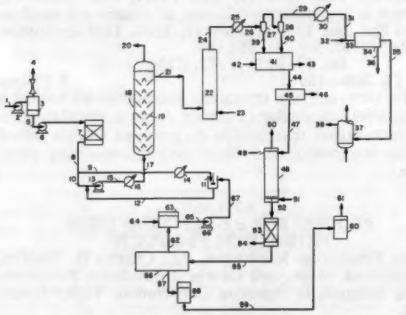
ALKALI METAL DESULFURIZATION PROCESS FOR PETROLEUM OIL STOCKS

Roby Bearden, Jr., Baton Rouge, La., assignor to Esso Research and Engineering Company

Filed May 24, 1972, Ser. No. 256,438

Int. Cl. C10g *17/00, 19/00*

U.S. Cl. 208—208 M **15 Claims**



Low sulfur-content petroleum oil stocks are prepared by contacting a sulfur-containing oil stock with an alkali metal, preferably sodium, or an alkali metal alloy, preferably sodium/lead, to produce a mixture comprising a low sulfur content oil containing alkali metal salt dispersed therein. The mixture of salts in oil is resolved by contacting the same, in one embodiment of the invention, with 10–80 mole percent H_2O based on total moles of salt in the oil, at a temperature of at least about 610° F., whereupon a salt phase separates from the oil. In a second embodiment of the invention, the contacting is conducted with about 110–200 mole percent H_2O, at a temperature ranging between about 500–750° F. In a latter embodiment, the water-treated mixture is subsequently cooled to below about 250° F. Thus separated the salt is blended with a molten sulfur-rich alkali metal polysulfide and H_2S thereby forming a sulfur-depleted alkali metal polysulfide which is then decomposed electrolytically to form alkali metal and a sulfur-rich polysulfide, which is subsequently reduced in sulfur content.

3,791,967

HYDRODESULFURIZATION WITH A POROUS XEROGEL CATALYST CONTAINING HYDROGENATING COMPONENTS AND METAL PHOSPHATE DISPERSION

Joseph Jaffe, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Application Feb. 26, 1970, Ser. No. 14,687, which is a continuation-in-part of application Ser. No. 843,207, July 18, 1969, now Patent No. 3,516,927, which in turn is a continuation-in-part of application Ser. No. 671,994, Oct. 2, 1967, now Patent No. 3,493,517. Divided and this application Mar. 27, 1972, Ser. No. 238,677

Int. Cl. C10g *23/02*

U.S. Cl. 208—216 **2 Claims**

Hydrodesulfurization is carried out with a porous xerogel of alumina, silica or mixtures thereof containing: nickel or cobalt; tungsten; and a tetravalent metal phosphate dispersion in which the metal is either titanium, zirconium, thorium, tin, hafnium or cerium.

3,791,968

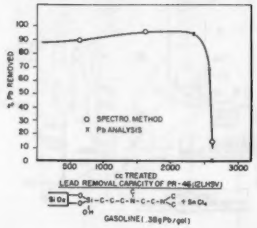
SORBENT FOR REMOVAL OF HEAVY METALS

Darrell Duayne Whitehurst, Titusville, Stephen Alan Butter, East Windsor, and Paul Gerhard Rodewald, Jr., Rocky Hill, N.J., assignors to Mobil Oil Corporation

Filed Dec. 29, 1972, Ser. No. 319,265

Int. Cl. C10g *17/00*

U.S. Cl. 208—251 **19 Claims**



A novel use for sorbents involving the selective removal of heavy metals from liquid streams has been discovered. More specifically it has been discovered that these sorbents selectively remove alkyl lead moieties from gasoline. The sorbents are comprised of metal halides (preferably tin tetrachloride or antimony pentachloride) bonded to a suitable substrate through tertiary amine or alkyl halide functional groups. The sorbents can be effectively regenerated.

3,791,969

PROCESS FOR PREPARING VERMICULITE PERMSELECTIVE MEMBRANES

Arvind S. Patil, Silver Spring, Rip G. Rice, Ashton, and John W. Kraus, Glenwood, Md., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Filed Mar. 22, 1972, Ser. No. 236,970

Int. Cl. B01d *13/00*

U.S. Cl. 210—23 6 Claims

A permselective membrane is prepared by providing an aqueous suspension of sodium exfoliated vermiculite, replacing at least part of the exchange sites with ions of a metal of Groups I–A and II–A of the Periodic Table, flocculating the resulting suspension, and dewatering the flocculated mass whereby the vermiculite platelets are aligned into a thin cohesive membrane. The membrane is useful in a variety of selective separation processes, such as water purification, and to process other solvents having soluble ionic contaminants. The membrane may be further modified to provide desiccating properties by incorporating various solid adsorbents, such as silica gel and activated carbon.

3,791,970

SOLID LUBRICANT

Irvin L. Tubb, San Diego, Calif., assignor to General Dynamics Corporation, San Diego, Calif.

No Drawing. Filed July 24, 1972, Ser. No. 274,529

Int. Cl. C10m *7/16, 7/44*

U.S. Cl. 252—12 2 Claims

A lubricant in solid form at room temperature comprising 1-hexadecanol (cetyl alcohol) tricresyl phosphate is disclosed. The lubricant is ordinarily used in cast stick, cake or tube form and is either applied to a surface by rubbing the end of the stick on the surface to be lubricated or the tool is coated by inserting it in the lubricant. This lubricant has been found to be highly effective for use with metal working drills, saws, etc. The lubricant is not brittle and adheres to surfaces without powdering. It also exhibits improved lubricity.

3,791,971

LUBRICATING OIL COMPOSITIONS

Warren Lowe, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Continuation-in-part of application Ser. No. 142,838, May 10, 1971, which is a continuation-in-part of application Ser. No. 45,567, June 11, 1970, now Patent No. 3,711,406. This application Jan. 5, 1972, Ser. No. 215,643

Int. Cl. C10m *1/10, 1/28, 1/40*

U.S. Cl. 252—33.4 8 Claims

Polyoxyalkylene glycols and their reaction products with organic diisocyanate and dicarboxylic acid are combined with alkaline earth metal carbonates dispersed in a hydrocarbon medium to provide lubricating compositions of superior acid neutralization capability and rust inhibition in internal combustion engines.

3,791,972

LUBRICATING GREASE

William A. Myers, La Mirada, Calif., assignor to Southwest Petro-Chem, Inc., Wichita, Kans.

No Drawing. Filed Jan. 13, 1972, Ser. No. 217,661

Int. Cl. C10m *5/08*

U.S. Cl. 252—37.7 16 Claims

A lubricating grease of improved properties is prepared by forming an aluminum complex soap in a paraffin oil by sequentially reacting an aluminum alkoxide with an aromatic carboxylic acid and then with a higher fatty acid, followed by blending with an isobutylene polymer and a low viscosity paraffin oil.

3,791,973

GREASE THICKENED WITH LITHIUM SOAP OF HYDROXY FATTY ACID AND LITHIUM SALT OF ALIPHATIC DICARBOXYLIC ACID

Syed S. H. Gilani, Madison Heights, Mich., and Donald W. Murray, Sarnia, Ontario, Canada, assignors to Esso Research and Engineering Company

No Drawing. Continuation-in-part of abandoned application Ser. No. 118,543, Feb. 24, 1971. This application Feb. 18, 1972, Ser. No. 227,622

Int. Cl. C10m *5/14*

U.S. Cl. 252—41 10 Claims

A multipurpose grease having a dropping point in excess of 500° F. is prepared by using as the grease thickener a combination of a lithium soap of a C_{12} to C_{24} hydroxy fatty acid, e.g. 12-hydroxy stearic acid and a lithium soap of a C_2 to C_{12} aliphatic dicarboxylic acid, e.g., azelaic acid, and by employing a particular sequence of steps that includes the separate formation of the individual soaps in the base stock of the grease, the hydroxy fatty acid soap being formed first.

3,791,974

BACTERIAL SPOILAGE INHIBITED METAL WORKING LUBRICANT COMPOSITIONS

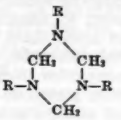
Earl E. Borchert, Valley View Village, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

No Drawing. Filed Apr. 6, 1972, Ser. No. 241,843

Int. Cl. C10m *1/06*

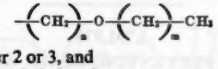
U.S. Cl. 252—49.5 8 Claims

Metal working lubricant compositions used to cool and lubricate metal in cutting, grinding, rolling, drawing and similar metal working operations are protected against bacterial spoilage during use by the presence of 10 to 3000 p.p.m. of a triazine compound of the formula:



wherein

R is



n is the number 2 or 3, and

m is the number 0, 1, 2 or 3.

3,791,975

BIODEGRADABLE LUBRICANTS

Nicholas Halkias, Woodbury Heights, N.J., assignor to Mobil Oil Corporation

No Drawing. Filed June 10, 1971, Ser. No. 151,906

Int. Cl. C10m *3/20*

U.S. Cl. 252—49.5 10 Claims

Biodegradable water-in-oil emulsion lubricants are provided, comprising, by weight, a major amount of water dispersed in a continuous phase comprising a biodegradable compound of the general formula: R_nX, in which:

R is a straight-chain alkyl group having from 1 to 18 carbon atoms;

X is a straight-chain ester of a fatty organic acid having from 1 to 20 carbon atoms or benzene; and

n is 1 or 2.

3,791,976

METHOD FOR RAPIDLY OPERATING GROUND EQUIPMENT EMBODYING HYDRAULIC SYSTEM USING ALL SEASON PETROLEUM HYDRAULIC FLUID

Joseph F. Messina, Havertown, and Abraham Mertwoy, Dresher, Pa., assignors to the United States of America as represented by the Secretary of the Army

No Drawing. Continuation-in-part of abandoned application Ser. No. 74,142, Sept. 21, 1970. This application Nov. 11, 1971, Ser. No. 197,944

Int. Cl. C09k *3/02*

U.S. Cl. 252—75 2 Claims

A single hydraulic fluid petroleum base blend consisting of a highly refined petroleum fraction of a naphthenic coastal crude, said crude being hydrogenated, solvent refined and fractionated, said blend having a viscosity 1.32 centistokes at 98.9° C. and 381 centistokes at —53.9° C. and possessing good oxidation stability, good rust protection and good antiwear properties achieved by addition of tricresyl phosphate, phenyl-1-naphthylamine and barium dinonylnaphthylene sulfonate, is applied to the hydraulic system of ground equipment, and the turret system of said ground equipment is operated continuously for at least 213 hours.

3,791,977

HEAVY DUTY EXOTHERMIC ALL-PURPOSE CLEANING COMPOSITIONS

Selwyn J. Ancel, River Forest, and James O. Gladish, Glenview, Ill., assignors to Chemtrust Industries Corporation, Maywood, Ill.

No Drawing. Filed June 14, 1971, Ser. No. 153,102

Int. Cl. C11d *7/06, 7/16, 7/26*

U.S. Cl. 252—156 1 Claim

Heavy duty, exothermic, all-purpose cleaning compositions having utility as general cleaning agents, as hair removal and drain cleaning agents, and as rust removal agents, which comprise, in admixture and as essential active ingredients, an acidic agent and a caustic alkali, which, when contacted with water, act to generate a hot solution capable, among other things, of fluidizing, solubilizing and/or digesting grease, oil, grime, hair and rust. Small proportions of other ingredients such as compatible surfactants, bleaching agents, germicides, and the like, desirably are incorporated in the compositions.

3,791,978

PROCESS OF PREVENTING SCALE AND DEPOSIT FORMATION IN AQUEOUS SYSTEMS AND COMPOSITIONS

Friedrich Krueger, Edingen, and Lieselotte Bauer, Bad Duerkheim, Germany, assignors to Joh. A. Benckiser GmbH, Chemische Fabrik, Ludwigshafen am Rhine, Germany

No Drawing. Continuation-in-part of abandoned application Ser. No. 36,403, May 11, 1970. This application Nov. 17, 1971, Ser. No. 199,792

Claims priority, application Germany, Nov. 20, 1970, P 20 57 008.5

Int. Cl. C02c *5/06*

U.S. Cl. 252—180 12 Claims

Scale formation as well as deposition of incrustations in aqueous systems are prevented by the addition of a composition containing starch degradation products and phosphonic acids, preferably in substoichiometric amounts calculated for the scale and hardness causing compounds present in aqueous systems. Acrylic acid and/or methacrylic acid polymers or copolymers with polymerizable ethylenically unsaturated compounds may also be added.

3,791,979

ACTIVATED CHLORATE

Harold de Vere Partridge, Wilson, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Original application Feb. 16, 1971, Ser. No. 115,730. Divided and this application Dec. 10, 1971, Ser. No. 206,894

Int. Cl. C01b *11/14*

U.S. Cl. 252—187 6 Claims

Activated alkali metal chlorate compositions for use in bleaching processes are produced by dissolving an amount of an activator selected from the water soluble salts of silver, manganese, arsenic, hexavalent chromium and vanadium pentoxide in an aqueous solution of an alkali metal chlorate and co-precipitating the activator in homogeneous admixture with the chlorate salt.

3,791,980

PROCESS FOR ESTABLISHING REACTIVE CONTACT BETWEEN REACTIVE INGREDIENTS

Clifton R. Goldsmith, Borger, Tex., assignor to Phillips Petroleum Company

Original application Aug. 3, 1970, Ser. No. 60,533, now Patent No. 3,679,599. Divided and this application Mar. 17, 1972, Ser. No. 235,490

Int. Cl. C09k *3/00, 3/30*

U.S. Cl. 252—188.3 R 4 Claims

A curing agent (for example, an amine) for an epoxy resin is encapsulated in a readily rupturable thermoplastic material (for example, wax), and admixed with an epoxy resin under a first pressure which is in excess of atmospheric and sufficient to preclude rupture of said readily rupturable thermoplastic material. The resulting admixture is thereafter exposed to a second pressure less than the first pressure, whereby said readily rupturable thermoplastic material is ruptured, thereby causing the mixture of curing agent and epoxy resin to come into reactive contact.

3,791,981

VOLUME REDUCTION OF RADIOACTIVE ION EXCHANGE RESINS FOR DISPOSAL

Calvin Calmon, Springfield Township, N.J., assignor to Aerochem Research Laboratories, Inc.

Filed Apr. 7, 1971, Ser. No. 132,098

Int. Cl. C09k *3/00*

U.S. Cl. 252—301.1 W 12 Claims

Ion exchange resins which have become contaminated with radioactivate materials, are reduced in volume for purposes of disposal by treating the contaminated resins with certain solvents having a dielectric constant of about 45 or lower. Solvents, such as, methanol, ethanol and acetone may be used to reduce the volume of the contaminated resins prior to storage and/or disposal. The method of this invention as applied to disposal of radioactively contaminated ion exchange resins reduces the space required for storage and/or burial of bulk quantities of this type of radioactive waste material, provides a self-sealing medium within the storage containers to prevent small leaks when the containers are stored in an aqueous medium, and promotes burning of the resin in cases where incineration is desirable.

3,791,982

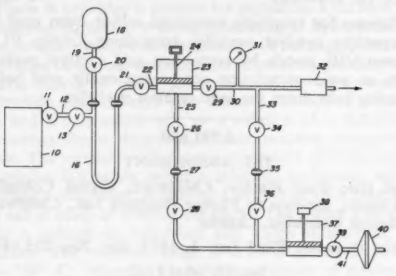
RADIOACTIVE XENON SOLUTION

Robert E. Lewis and Lloyd A. Hanson, Pleasanton, Calif., assignors to General Electric Company

Filed July 19, 1972, Ser. No. 273,095

Int. Cl. C01f *13/00*

U.S. Cl. 252—301.1 R 23 Claims



An aqueous solution having dissolved therein an isotopic mixture comprising natural xenon and a radioactive isotope of xenon is presented along with a method of preparing the aqueous solution.

3,791,983

SPRAYABLE AND AEROSOLIZABLE WEB-FORMING COMPOSITIONS

Theodore Maierson, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

No Drawing. Continuation-in-part of abandoned application Ser. No. 659,857, Aug. 11, 1967. This application Apr. 22, 1968, Ser. No. 723,285

Int. Cl. B01j *13/02*; C08d *9/12*; C09k *3/30*

U.S. Cl. 252—305 11 Claims

There are disclosed sprayable and aerosolizable web-forming compositions for forming self-supporting, three dimensional webs of randomly associated, joined monofilaments ranging in average diameter from about 1 to 10 microns, the sprayable web-forming compositions comprising a water-insoluble hydrocarbon elastomer, at least one water-insoluble resin of hydrogenated rosins and polyol esters thereof, phenolic resins, hydrocarbon resins or coumarone-indene resins compatible with said elastomer, and solvent compatible with said elastomer and said resin, and the aerosolizable web-forming composition comprising, in addition to the components stated for the sprayable web-forming compositions, a propellant inert to said elastomer, resin and solvent. The sprayable and aerosolizable web-forming compositions may contain encapsulated components, e.g., coloring agents, perfumes or other scents, e.g., insect sex attractants, agricultural chemicals, insecticides, etc. A plasticizer can be included in the aerosolizable formulation to impart increased tackiness to the web over extended time periods. The web-forming polymer solutions or dispersions can be dispensed from various types of dispensing systems and equipment, e.g. from spray guns, portable aerosol cans, etc. to provide an advantageous way of dispensing agricultural treating agents or other encapsulated materials onto plants or other desired repositories or locations without interfering therewith, e.g. with plant growth or metabolic processes thereof.

3,791,984

METHOD AND APPARATUS FOR THE MANUFACTURE OF AN EMULSION

Hans G. Brogli, Gotthelfstrasse 42, Basel, Switzerland, and Werner F. Brogli, Kindergartenstrasse 3, Reinach, Switzerland

Filed May 21, 1971, Ser. No. 145,853

Claims priority, application Switzerland, June 1, 1970, 8,159/70

Int. Cl. B01j *13/00*

U.S. Cl. 252—308 2 Claims

The disclosure relates to the manufacture of emulsions. A first liquid, for example a fat or wax, is heated, for example to melt it. A second, cold liquid is gradually introduced into the heated first liquid while stirring. This is made possible by introducing the second liquid in fine distribution into the draw in area of a stirring member running in the heated first liquid, and it permits the attainment of a cool, stable emulsion with no or little additional cooling. The temperature of the finished emulsion after completion of the introduction of the second liquid may be below the limit temperature up to which the emulsion is stable, and/or below the solidification temperature of the first liquid. Also disclosed are apparatus for manufacturing emulsions, comprising a mixing and/or homogenizing tool with a rotatable stirring member. At least one nozzle is disposed at the inlet side of said tool for introducing the second liquid in fine distribution into the draw in area of the stirring member.

3,791,985

LUBRICATING COMPOSITIONS CONTAINING SULFUR CONTAINING PHOSPHATE ESTERS

Fred S. Eiseman, Jr., Maplewood, and Leslie M. Schenck, Mountainside, N.J., and John P. G. Beiswanger, Audubon, Pa., assignors to GAF Corporation, New York, N.Y.

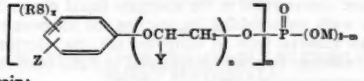
No Drawing. Original application Oct. 13, 1970, Ser. No. 80,477, now Patent No. 3,723,578. Divided and this application June 9, 1972, Ser. No. 261,342

Int. Cl. C10m *1/48, 3/42, 1/06*

U.S. Cl. 252—32.7 R 5 Claims

Sulfur containing phosphate esters of thio ethers of phenols and alkoxylated phenols are described, together with methods for their preparation and their use as lubricants. The sulfur containing phosphate esters described are represented by the general formula:

(I)



wherein:

R is an alkyl group of 1–20 carbon atoms, phenyl or aralkyl

x is an integer of from 1 to 3 inclusive

n is an integer of from 0 to 50 inclusive (preferably 1–20)

m is an integer of 1 to 3 inclusive

Y is hydrogen, methyl or ethyl

Z is hydrogen or alkyl, of 1 to 20 carbons atoms and

M is a cation, e.g. H, alkali metal, alkaline earth metal, heavy metal, ammonium or amino.

These sulfur containing phosphate esters have valuable lubricating properties and exhibit good anti-wear extreme pressure properties both alone or in water or as additives to other lubricants, such as mineral oils, especially for use as cutting oils or other metal working applications, gear lubricants, etc.

3,791,986

PRECONDITIONER CONCENTRATE

Charles D. Mallico, Stratford, Conn., assignor to Enthone, Incorporated, New Haven County, Conn.

No Drawing. Filed Oct. 28, 1971, Ser. No. 193,589

Int. Cl. B01f *17/32*

U.S. Cl. 252—355 7 Claims

Surfaces of electrical insulating synthetic resin material, especially reinforced epoxy surfaces, are preconditioned without severly attacking, roughening and/or distorting the surfaces by contacting the surfaces with an acidic solution containing a five-membered nitrogen heterocyclic compound, for example 2-pyrrolidone, until the surfaces are rendered conditionable by a strong acid aqueous oxidizing conditioning solution. The resulting conditionable surfaces are then conditioned by contact with the strong acid aqueous oxidizing solution, followed by electroless metal plating of the surfaces to obtain a smooth chemical reduction metal deposit thereon which is of acceptable appearance and firmly adhered to the surfaces. The invention is especially useful in the preparation of additive-type printed circuit boards.

3,791,987

MINUTE CAPSULES HAVING WALLS OF SILICEOUS MATERIAL-HYDROXY-CONTAINING MATERIAL COMPLEX AND PROCESS FOR THEIR MANUFACTURE

Gene O. Fanger, Worthington, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

No Drawing. Continuation of abandoned application Ser. No. 41,114, May 27, 1970. This application Feb. 3, 1972, Ser. No. 232,321

Int. Cl. B01j *13/02;* B44d *1/02*

U.S. Cl. 252—316 4 Claims

A process is disclosed for manufacturing minute capsules, en masse, wherein the capsule walls comprise a hardened silicate material. The process includes liquid-liquid phase separation of the wall material silicate from solution as silicic acid in an aqueous capsule manufacturing vehicle by means of a glycol phase-separation-inducing material. Preferred starting materials for the present process include alkali-metal water glass and polyethylene glycol.

The present liquid-liquid phase separation can be considered to be similar to so-called "complex coacervation" of the prior art in that a complex of two polymeric materials are concentrated in the emergent liquid phase. The capsule walls are solidified by reacting the siliceous capsule wall material with an inorganic salt, viz, aluminum sulfate, calcium chloride, magnesium sulfate, iron chloride or magnesium bromide.

3,791,988

DIAGNOSTIC TEST FOR GLUCOSE

Dieter Josef, Pratteln, and Alfred Lampart, Magden, Switzerland, and Pirmm Schwartz, Weil am Rhine, Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Mar. 23, 1972, Ser. No. 237,528

Int. Cl. G01n *33/16*

U.S. Cl. 252—413 1 Claim

An improved diagnostic composition for the quantitative determination of glucose in biological fluids comprising glucose oxidase, a phenazin and/or phenoxazin-derivative and a tetrazolium salt as well as the incorporation thereof upon a bibulous carrier are described.

3,791,989

CATALYST REJUVENATION WITH OXALIC ACID

David S. Mitchell, San Rafael, Alan G. Bridge, El Cerrito, and Joseph Jaffe, Berkeley, Calif., assignors to Chevron Research Company, San Francisco, Calif.

No Drawing. Continuation-in-part of abandoned application Ser. No. 799,124, Feb. 13, 1969. This application Mar. 12, 1971, Ser. No. 123,828

Int. Cl. B01j *11/02, 11/76*

U.S. Cl. 252—413 1 Claim

Process for removing vanadium sulfide from used hydrotreating catalyst particles comprising Group VI or Group VIII metals by contacting said catalyst particles with an aqueous solution comprising oxalic acid before burning coke from the used catalyst particles.

3,791,990

OIL ABSORBENT

Karl Otto Paul Fischer, Chilliwack, British Columbia, Canada, assignor to Fischer Holdings Ltd., Chilliwack, British Columbia, Canada

No Drawing. Filed Jan. 3, 1972, Ser. No. 215,165

Int. Cl. B01j *1/22*

U.S. Cl. 252—427 6 Claims

An oil absorbent material, specifically peat, having a moisture content of less than ten percent by weight for use particularly in removing oil film from water.

3,791,991

REDUCTION OF COPPER OXIDE WITH PALLADIUM

Virgil L. Seale and Donald G. Ries, Brookhaven, Miss., and Jerry J. Svarz, La Grange, Ill., assignors to Nalco Chemical Company, Chicago, Ill.

No Drawing. Filed June 12, 1972, Ser. No. 261,661

Int. Cl. B01j *11/06*

U.S. Cl. 252—447 5 Claims

A method of reducing an aqueous slurry comprising cupric oxide and cupric hydroxide and mixtures thereof which comprises reacting said slurry in the presence of hydrogen with a base and a supported palladium catalyst for a period of about one hour at ambient temperature (40–110° F.), moderate superatmospheric pressure (5–10 atmospheres), and pH control at about 9.0–10.0.

This method produces a convenient product of reduced copper oxide for input to a commercial hydrolysis of nitriles (such as acrylonitrile) to amides.

3,791,992

PREPARATION OF A MAGNESIUM SPINEL CATALYST BASE

Raymond Douglas Feldwick, Timonium, Md., assignor to W. R. Grace & Co., New York, N.Y.

No Drawing. Filed Oct. 6, 1972, Ser. No. 295,664

Int. Cl. B01j *11/06*

U.S. Cl. 252—463 9 Claims

The present invention is directed to a process for preparing a spinel-containing catalyst base characterized by shrinkage of less than about 3 percent after heating to temperatures in excess of 1500° F. comprising mixing a solution of a soluble acid salt of divalent magnesium with a solution of an alkali metal aluminate; separating and washing the resulting precipitate; exchanging the precipitate with an ammonium compound; followed by washing, drying, forming, and calcination. The catalyst base is especially useful for supporting auto exhaust conversion catalysts.

3,791,993

PROCESS FOR THE PRODUCTION OF A REFORMING CATALYST

Jens Richard Rostrup-Nielsen, Copenhagen, Denmark, assignor to Haldor Topsoe A/S, Soborg, Denmark

No Drawing. Continuation of abandoned application Ser. No. 734,232, June 4, 1968. This application Oct. 16, 1970, Ser. No. 81,534

Int. Cl. B01j *11/22*
U.S. Cl. 252—466 J 8 Claims

There is provided a process for preparing a catalyst for reforming, particularly steam reforming of hydrocarbons. The process consists fundamentally in mixing intimately a solution of sodium or potassium aluminate, possibly containing excess of base (preferably sodium or potassium hydroxide, respectively) with either a solution of a nickel salt and a magnesium salt, or a solution of a nickel salt containing finely dispersed therein reactive magnesium oxide. The mixing results in coprecipitation of a fine sludge containing intimately mixed aluminium hydroxide, nickel hydroxide and either magnesium hydroxide (if a magnesium salt is used) or magnesium oxide. The sludge also contains a sodium or potassium salt which is removed by washing. The washed sludge is dried and dehydrated at 300–750° C., whereby an intimate mixture of oxides of magnesium, aluminium and nickel is formed. This mixture is pelletted in conventional manner and the pellets or bodies calcined at a temperature of 850–1100° C. The calcination involves conversion of alumina and part of the magnesia into spinel, whereas remaining magnesia during reforming acts as "promoter," i.a. to counteract carbon deposition. The precursor thus obtained contains NiO and can be reduced, preferably by hydrogen, and is thereafter suitable as catalyst containing elemental Ni for reforming reactions.

3,791,994

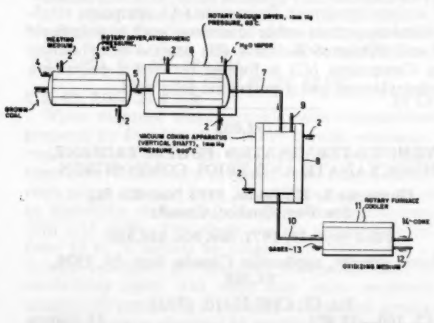
METHOD OF PRODUCING ADSORPTION COKE FROM HIGH WATER CONTENT BROWN COAL

Werner Wenzel, Friedrich Hermann Franke, and Raymund Jäger, Aachen, Germany, assignors to Rheinische Braunkohlenwerke AG., Cologne, and Werner Wenzel, Aachen, Germany

Filed May 19, 1971, Ser. No. 144,803

Claims priority, application Germany, May 19, 1970, P 20 24 210.8

Int. Cl. C10b *47/20*
U.S. Cl. 252—421 8 Claims



In a method of producing adsorbent materials, such as adsorption cokes from a raw material of high water content, such as raw brown coal, at least one part of the vaporizable components of said raw material are removed by exposing said raw material to a vacuum.

3,791,995

BRAUNITE-GLASS CATALYTIC PARTICLES AND METHOD OF PREPARATION

Dong Myung Chay, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 24, 1971, Ser. No. 201,894

Int. Cl. B01j *11/06*
U.S. Cl. 252—471 7 Claims

A ceramic, porous, catalytic fired composition containing 40–80 weight percent of braunite,

$$(MnO \cdot 3Mn_2O_3 \cdot SiO_2),$$

10–50 weight percent of an amorphous binder phase, and 0–20 weight percent of a refractory crystalline phase can be combined with porcelain enamels and applied as a coating to various surfaces to catalyze oxidation reactions. This composition is an effective catalyst for oxidation of food spatter in self-cleaning ovens and for the oxidation of vapors in emission control devices.

ERRATUM

For Class 260—61 see:
Patent No. 3,791,890

3,791,996

DIRECT ACYLAMINOMETHYLATION OF AROMATIC POLYMERS

Richard B. Wuchter, Huntingdon Valley, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

No Drawing. Filed Nov. 1, 1971, Ser. No. 194,496

Int. Cl. C08f *27/08*
U.S. Cl. 260—2.1 E 10 Claims

A novel method of preparing resins is presented which involves the direct acylaminomethylation of uncrosslinked or crosslinked aromatic polymers, for example styrene-containing polymers. Acylaminomethylated crosslinked aromatic polymers are readily hydrolyzed to the corresponding aminomethylated polymers and then optionally quaternized to form the corresponding strong base, quaternary ammonium anion exchange products.

3,791,997

WATER VAPOR PERMEABLE FLEXIBLE SHEET MATERIALS

George Stuart Hathorn and Victor Ralph Cunningham, Dagenham Dock, England, assignors to Porvair Limited, Essex, England

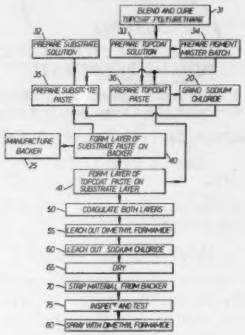
Continuation of abandoned application Ser. No. 697,165, Jan. 11, 1968. This application Nov. 19, 1970, Ser. No. 91,167

Claims priority, application Great Britain, Jan. 11, 1967, 1,611/67

Int. Cl. B29d *7/22, 27/04;* C08g *22/04*
U.S. Cl. 260—2.5 AY 16 Claims

In a method of making water vapor permeable flexible sheet materials, which find uses as replacements for leather, which included two superimposed layers, a substrate layer is formed of a layer of a mixture of powdered removable filter dispensed through a polymer solution in which adheres to a temporary backer, and before the solvent is removed a top coat layer of a similar mix-

ture is formed on the substrate layer, the polymer is coagulated and the filler leached out from both layers by



suitable liquid treatment, the two superimposed layers are dried and stripped as one layer from the supports.

3,791,998

PASTE TYPE ORGANOPOLYSILOXANE COMPOSITION AND FABRICS COATED THEREWITH

Carl Newton Bruns, Adrian, Mich., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Continuation of abandoned application Ser. No. 781,606, Dec. 5, 1968. This application July 19, 1971, Ser. No. 164,117

Int. Cl. C08g *51/04, 51/50;* **C08k** *1/08*
U.S. Cl. 260—2.5 S **9 Claims**

A flowable organopolysiloxane composition comprising an organopolysiloxane polymer having a viscosity between 100,000 and 750,000 centistokes, a curing agent, a hydroxyl-terminated organopolysiloxane, and filler to form a composition having a penetrometer value of between 250 and 350. The composition may be applied to an untreated fabric and thereafter cured at an elevated temperature to form a silicone rubber impregnated fabric.

3,791,999

PROCESS FOR PREPARING A CROSS-LINKED POROUS COPOLYMER

Yutaka Fuchiwaki, Tokyo, and Takashi Nishikaji, Yokohama, Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

Filed Dec. 16, 1971, Ser. No. 208,689

Claims priority, application Japan, Dec. 19, 1970, 45/114,712

Int. Cl. C08f *15/02, 47/08*
U.S. Cl. 260—2.5 M **10 Claims**

A cyano group-containing cross-linked porous copolymer, which is large in surface area and high in porosity and high in adsorptivity for polar substances, is obtained by polymerizing a monovinyl cyanide, or a monovinylidene cyanide, monomer, with a polyvinyl monomer, in the presence of an organic solvent which is inert to these monomers, and which functions both as a solvent therefor and as a swelling agent for the resulting copolymer, and with a linear monovinyl polymer, which is capable of forming a homogeneous liquid phase with the monomers and the solvent, and thereafter removing the linear polymer from the resulting copolymer by extraction.

3,792,000

ANTIFOULING COMPOSITION AND METHOD OF PREPARATION

Marvin T. Conger, Theodore A. Evans, and Larry A. Gordon, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed June 9, 1971, Ser. No. 151,532

Int. Cl. A01m *1/20;* **C08l** *45/64;* **C09b** *5/14*
U.S. Cl. 260—3.5 **8 Claims**

Antifoulant compositions are made by forming a mixture of an elastomer, a resin and antifoulant, preferably of a tin compound, with the elastomer having a glass transition temperature below ambient temperature and the resin having a glass transition temperature above ambient temperature.

3,792,001

CATALYSIS OF URETHANE FOAMS WITH A MIXTURE OF AN ANTIMONY TRIHALIDE AND EITHER AN ANTIMONY ALCOHOLATE OR AN ANTIMONY CARBOXYLATE

John K. Allen, Batavia, and John A. Cengel, Wheaton, Ill., assignors to Standard Oil Company, Chicago, Ill.

No Drawing. Filed Aug. 21, 1972, Ser. No. 282,461

Int. Cl. C08g *22/40, 22/44*
U.S. Cl. 260—2.5 AB **20 Claims**

The catalysis of urethane foams is improved by the use of a mixture of an antimony trihalide and either an antimony alcoholate or an antimony carboxylate. This catalyst mixture is particularly useful in the preparation of rigid urethane-type foams prepared from polyarylpolyisocyanates and free carboxy-containing adduct polyols. The catalyst mixture is also effective in rigid urethane-type foams containing aromatic carboxylic acid derivatives as a third principal component.

3,792,002

HOT MELT PRESSURE SENSITIVE ADHESIVES

Bernhard Krieger, Bergkamen, Manfred Bolze, Bergkamen-Oberaden, and Manfred Drawert, Werne, Germany, assignors to Schering AG, Berlin, Germany

No Drawing. Filed Apr. 12, 1972, Ser. No. 243,423

Claims priority, application Germany, Apr. 17, 1971, P 21 18 796.2

Int. Cl. C08k *1/66*
U.S. Cl. 260—18 N **2 Claims**

Hot melt pressure sensitive adhesives comprising (A) a polyamide resin, (B) a tackifier, and either or both of (C) a further polyamide or polyester amide which functions to retain tack in the adhesives or (D) an ethylene/vinyl acetate copolymer. Polyamide (A) comprises ethylene diamine, certain ether diamines, and a polymeric fatty acid. Preferred tackifiers (B) are the colophonium resins, Component (C) is formed between a polyamine or hydroxylamine and a polymeric fatty acid.

3,792,003

HYDROXY-TERMINATED POLYBUTADIENE, DIISOCYANATE AND TRIOL COMPOSITION

Gonzague L. Duchesne, 3192 Neuville St., Ste. Foy, Quebec, Canada

Filed Sept. 29, 1971, Ser. No. 184,958

Claims priority, application Canada, Sept. 29, 1970, 94,308

Int. Cl. C08f *27/10, 27/12*
U.S. Cl. 260—18 TN **15 Claims**

An elastomeric composition is formed by mixing a hydroxy terminated polybutadiene formed by reacting a car-

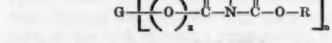
boxyl terminated polybutaliene with a mono-epoxide with a diisocyanate and a polyoxyalkylene triol. The composition is useful as a binder in forming a castable propellant. It also may be used as a low temperature structural material or as an insulator.

3,792,004
HIGH MOLECULAR WEIGHT PRODUCTS CAPABLE OF BEING CROSS-LINKED

Josef Pedain and Dieter Arlt, Cologne-Buchheim, and Hermann Hagemann, Cologne-Flittard, Germany, assignors to Bayer Aktiengeselischaft, Leverkusen, Germany

No Drawing. Filed July 10, 1970, Ser. No. 54,005
Claims priority, application Germany, July 17, 1969, P 19 36 399.6
Int. Cl. C08g *22/08, 22/18*
U.S. Cl. 260—22 TN **5 Claims**

High molecular weight compounds capable of being cross-linked by the application of heat under mild conditions and having the general formula



where G is the residue remaining after removal of at least two hydroxyl groups or at least two carboxylic acid groups from a high molecular weight polyhydric alcohol or high molecular weight polycarboxylic acid respectively; R is an aliphatic hydrocarbon radical having 1 to 18 carbon atoms or a trichloromethyl group; x is 0 or 1 and n is an integer equal to the number of hydroxyl groups or carboxylic acid groups removed from G.

3,792,005
LOW MOLECULAR WEIGHT BLOCK COPOLYMERS AND COATING COMPOSITIONS THEREOF

James T. Harlan, Jr., Torrance, Calif., assignor to Shell Oil Company

No Drawing. Filed Feb. 7, 1972, Ser. No. 224,315
Int. Cl. C08c *11/22;* **C08d** *9/12;* **C08f** *19/08*
U.S. Cl. 260—27 BB **9 Claims**

Block copolymers having unexpectedly high tensile strength and low solution viscosity comprise polymers having at least one hydrogenated conjugated diene polymer block having an average molecular weight between 18,000 and 35,000, and at least two monoalkenyl arene polymer blocks having an average molecular weight between 4,000 and 7,500. Coating compositions thereof comprise the above polymers dispersed in a solvent carrier having a Hildebrand solubility parameter between about 7.5 and 9.2 $(cal./cm.^3)^{\frac{1}{2}}$.

3,792,006
WATER EXTENDED VINYL ESTER RESINS

Daniel J. Najvar, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation of abandoned application Ser. No. 762,344, Sept. 16, 1968. This application Sept. 21, 1971, Ser. No. 182,531
Int. Cl. C08f *45/24, 43/02*
U.S. Cl. 260—29.6 NR **16 Claims**

Water extended thermosettable resin compositions are prepared by forming stable water-in-resin emulsions with vinyl ester resins, certain modified vinyl ester resins and vinyl ester/unsaturated polyester resin compositions. The resin phase contains from 30 to 60 percent by weight of an essentially water insoluble monomer copolymerizable with said resins. The emulsions are prepared to contain from 30 to 70 percent by weight water. The novel water-in-resin emulsions are prepared without the need for an emulsifying agent. The vinyl ester resins employed are compounds containing a plurality of terminal unsaturated acid ester groups obtained by reaction of compounds having a plurality of oxirane groups with alpha, beta-unsaturated carboxylic acids.

3,792,007
FLAME RETARDANT LATEX

Edward H. Gleason and Leonard F. Guziak, Monroeville, Pa. (both % Koppers Company, Inc., Koppers Bldg., Pittsburgh, Pa. 15219)

No Drawing. Continuation-in-part of abandoned application Ser. No. 26,419, Apr. 3, 1970. This application Nov. 15, 1971, Ser. No. 198,970
Int. Cl. C08d *7/10;* **C09d** *5/18*
U.S. Cl. 260—29.7 P **4 Claims**

A self-extinguishing polymer composition in latex form has been prepared by the adding from 1 to 10 parts by weight of tris(2,3-dibromopropyl) phosphate in combination with a synergistic amount (0.5 to 3.0 parts by weight) of a salt selected from the group consisting of monoammonium phosphate, diammonium phosphate and triammonium phosphate, to a terpolymer comprising 20–70 parts by weight of an aryl vinyl monomer and 30–80 parts by weight of a conjugated diolefin, and 0.5–10 parts by weight of an α,β-ethylenically unsatuarted carboxylic acid. If desired, a portion of the ammonium salt may be added to the latex during polymerization as well as after the polymerization.

3,792,008
CURABLE ORGANOPOLYSILOXANES

Charles George Neuroth, Blissfield, Mich., assignor to Stauffer Chemical Company

No Drawing. Filed Feb. 10, 1972, Ser. No. 225,295
Int. Cl. C08g *51/34, 51/50*
U.S. Cl. 260—30.6 SB **14 Claims**

An organopolysiloxane composition having improved flow characteristics which comprises an hydroxyl-terminated organopolysiloxane, cross-linking agents containing an organohydrogenpolysiloxane and an organosilicon compound of the general formula $R'_mSi(OR)_{4-m}$ in which R is a hydrocarbon radical having from 1 to 10 carbon atoms, R' is a monovalent hydrocarbon radical or a halogenated monovalent hydrocarbon radical having up to 10 carbon atoms and m is a number greater than 0 and up to 3, an organotin catalyst and an additive which reduces the viscosity of the composition. These compositions are useful in the preparation of molds where flow properties are essential and upon vulcanization will provide an elastomeric material having improved elongation and tear strength.

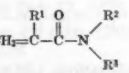
3,792,009
VAPOR PERMEABLE COMPOSITIONS

John P. Mudde, Oak Lawn, Ill., assignor to CPC International Inc.

No Drawing. Continuation-in-part of application Ser. No. 266,038, June 26, 1972, which is a continuation-in-part of application Ser. No. 244,251, Apr. 14, 1972, which is a continuation-in-part of application Ser. No. 226,202, Feb. 14, 1972, which in turn is a continuation-in-part of application Ser. No. 122,148, Mar. 8, 1971, all now abandoned. This application May 11, 1973, Ser. No. 359,284
Int. Cl. C08f *45/38, 45/40;* **C09d** *5/00*
U.S. Cl. 260—31.4 R **21 Claims**

The present invention is concerned with a water vapor permeable polymeric composition comprising a substantially homogeneous blend of:

(a) a normally hydrophilic linear thermoplastic polymeric material comprising from about 40 to about 60 parts by weight of a homopolymer, copolymer or graft copolymer of an unsaturated amide of the formula:



wherein R^1 is selected from the group consisting of hydrogen and alkyl of up to 4 carbon atoms, R^2 and R^3 are alkyl of up to 5 carbon atoms; and

(b) a normally hydrophobic polymer comprising from about 60 to about 40 parts by weight of a plasticized polymer of vinyl chloride, the combined weights of said normally hydrophilic and hydrophobic polymeric materials being 100 parts by weight,

said polymeric composition being capable of producing continuous films and foams having improved water vapor transmission properties.

3,792,010

PLASTICIZED POLYESTER SUTURES

David Wasserman, Springfield, and Alan J. Levy, Somerville, N.J., assignors to Ethicon, Inc.

Filed Mar. 27, 1972, Ser. No. 238,552

Int. Cl. C08g *51/42*

U.S. Cl. 260—32.2 R **4 Claims**

A poly [L(—) lactide-co-glycolide] obtained by polymerizing from 10 to 15 mol percent of L(—) lactide and from 85 to 90 mole percent of glycolide is plasticized with from about 10 weight percent to about 15 weight percent of bis-2-methoxyethyl phthalate and extruded to form flexible monofilaments that are sterilized with ethylene oxide. The sterile monofilament sutures have a straight tensile strength of about 65,000 to 72,000 p.s.i.; and a Young's modulus of from about 4.5×10^5 p.s.i. to about 6.8×10^5 p.s.i. The sutures retain up to about 37 percent of their original tensile strength for fifteen days when implanted in living animal tissue.

3,792,011

LOW-COST RESINOUS COMPOSITIONS COMPRISING NON-GLYCIDYL ETHER EPOXIDES

James D. B. Smith, Turtle Creek, and Robert N. Kauffman, Monroeville, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 14, 1971, Ser. No. 189,090

Int. Cl. C08g *51/04*

U.S. Cl. 260—37 EP **6 Claims**

A resinous composition, suitable as a low cost potting compound, is made from a mixture containing about 90 to 120 parts of a cycloaliphatic or acyclic aliphatic nonglycidyl ether epoxy resin, about 5 to 120 parts of a diglycidyl ether epoxy resin, about 50 to 200 parts of an acid anhydride and about 0.08 to 0.9 part of a quaternary organic phosphonium salt acting as a latent catalyst.

3,792,012

SILICONE RESIN USEFUL IN MOLDING COMPOSITIONS

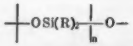
Joseph J. Zdaniewski, Scotia, N.Y., assignor to General Electric Company

No Drawing. Filed Mar. 17, 1972, Ser. No. 235,580

Int. Cl. C08g *51/04*

U.S. Cl. 260—37 SB **26 Claims**

A silicone resin composition having improved flexural strength and thermal shock properties comprising a resinous terpolymer compound having $RSiO_{3/2}$ units, R_2SiO units and



units where the R to Si ratio is 1.05 to 1.99. The R radical represents monovalent hydrocarbon radicals, halogenated monovalent hydrocarbon radicals where the R radicals in a particular unit are different which resin contains a total alkoxy and silanol content from 2% to 8% by weight and wherein the R radical in each unit has at least 10 mole percent aryl radicals.

A silicone molding composition may be prepared containing 5 to 100% of the above resin and 0 to 95% by weight of any well known silicone molding resin.

3,792,013

PALLADIUM-CONTAINING STABILIZERS FOR POLYOLEFINS

Howard E Dunn, Mount Vernon, Ind., and Ronald D. Mathis, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed Oct. 17, 1969, Ser. No. 867,359

Int. Cl. C08f *45/62*

U.S. Cl. 260—45.75 R **6 Claims**

Stabilizers for incorporation in polymers are disclosed, these stabilizers acting to provide a degree of stability to the polymer against the deteriorating effects of ultraviolet light but which do not significantly affect the whiteness or dyeability of the polymer.

3,792,014

PHENOL ANTIOXIDANT-GALLIC ACID ESTER STABILIZER SYSTEM

Kryn G. Ihrman, Farmington, and Robert E. Malec, Birmingham, Mich., assignors to Ethyl Corporation, Richmond, Va.

No Drawing. Continuation-in-part of abandoned application Ser. No. 283,725, Aug. 25, 1972. This application Sept. 15, 1972, Ser. No. 289,536

Int. Cl. C08f *45/58*

U.S. Cl. 260—45.85 B **22 Claims**

Olefinic polymers (e.g., polyethylene) normally subject to accelerated oxidative degradation when used in contact with copper are stabilized for prolonged periods by inclusion of a hydrocarbyl ester of gallic acid (e.g., propyl gallate) together with a phenolic antioxidant for olefinic polymers. The compositions are especially useful for extending the service life of polyolefin copper wire insulation.

3,792,015

PROCESS FOR PREPARING POLYESTER AND COPOLYESTER RESINS

James E. Duddey, Akron, Maneung Hahn, Tallmadge, and Joseph P. Schirmer, Jr., Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed June 19, 1972, Ser. No. 263,833

Int. Cl. C08g *51/58*

U.S. Cl. 260—45.95 H **8 Claims**

Linear polyester and copolyester resins having improved dyeability are prepared by reacting a free dicarboxylic acid and a glycol in the presence of a stabilizing composition and a metallic salt of isethionic acid and polycondensing the esterification product to form high molecular weight resin.

3,792,016

METAL IMIDAZOLATE-CATALYZED SYSTEMS

Brian K. Hill and J. Alan Kehr, St. Paul, Minn., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

No Drawing. Filed Jan. 6, 1972, Ser. No. 215,942

Int. Cl. C08g *30/14*

U.S. Cl. 260—47 EN **14 Claims**

Metal imidazolates are catalysts for conventional epoxy resin systems. The combination of a curing agent, epoxy monomer or prepolymer, and metal imidazolate is latent,

and cure is effected by heating the system. If a two-part system is desired, the metal imidazolate can be included in either the epoxy resin part or the curing agent part. Preferred metal ions of the metal imidazolates are the metals of Group VIII and Groups I(B) and II(B).

3,792,017

THERMALLY STABLE QUINOXALINE POLYMERS AND METHOD OF SYNTHESIS

Fred E. Arnold, Centerville, and Frederick L. Hedberg and Robert F. Kovar, Dayton, Ohio, assignors to the United States of America as represented by the Secretary of the Air Force

No Drawing. Filed Oct. 19, 1972, Ser. No. 298,975

Int. Cl. C08g *15/00*

U.S. Cl. 260—47 R **6 Claims**

Thermally stable quinoxaline polymers are prepared by solution polycondensation of certain aromatic heterocyclic fused tetraamines with aromatic dibenzils. The high thermal stability, the high glass transition temperature, or the lack of such a temperature, and the solubility of the polymers in aprotic solvents render them especially useful as adhesives and in high temperature applications such as in the fabrication of plastic composites and protective coatings.

3,792,018

PREPARATION OF CLEAR EPOXY RESINS CONTAINING HIGH MOLECULAR WEIGHT TRIEPOXIDE FLEXIBILIZERS

Ted J. Logan, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Continuation-in-part of abandoned application Ser. No. 195,455, Nov. 3, 1971. This application Oct. 20, 1972, Ser. No. 299,491

Int. Cl. C08g *30/14*

U.S. Cl. 260—47 EN **8 Claims**

A process and composition for producing clear, cured epoxy resins, said resins containing specified glycidyl ethers of propoxylated glycerine as flexibilizers, and being cured at room temperature.

3,792,019

FILMS OF POLYAMIDE-IMIDES HAVING A UNIPLANAR AXIAL STRUCTURE

Jean Gattus, La Mulatiere, and Maurice Mallet, Lyon, France, assignors to Rhone-Poulenc S.A., Paris, France

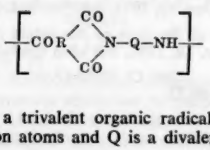
No Drawing. Filed Sept. 3, 1970, Ser. No. 69,493

Claims priority, application France, Sept. 5, 1969, 6930338

Int. Cl. C08g *20/32*

U.S. Cl. 260—47 CP **3 Claims**

Polyamide-imide films having a high elongation at break, and suitable for insulating electrical conductors which are to be subjected to stress, are made from polyamide-imides comprising structural units of formula:



in which R is a trivalent organic radical containing at least two carbon atoms and Q is a divalent radical containing at least one benzene nucleus, and are characterized by a uniplanar axial structure.

They can be made by giving a film of the polyamide-imide a treatment in which (a) it is stretched at 100°–350° C. while it contains at least 1%, preferably 5–30%, of solvent and (b) it is then given a supplementary heat treatment at 100°–350° C., while preventing shrinkage in any planar direction throughout the treatment.

3,792,020

HIGH-TEMPERATURE STABLE MODIFIED AROMATIC AMINE-ALDEHYDE MOLDING POWDERS MODIFIED WITH AROMATIC POLYCARBOXYLIC COMPOUNDS

Rodney M. Huck, Longmeadow, and John R. Le Blanc, Wilbraham, Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of abandoned application Ser. No. 119,536, Mar. 1, 1971. This application Oct. 30, 1972, Ser. No. 302,342

The portion of the term of the patent subsequent to July 18, 1989, has been disclaimed

Int. Cl. C08g *9/06, 15/00*

U.S. Cl. 260—65 **8 Claims**

Thermosettable molding powders of aromatic amine/formaldehyde resin and aromatic polycarboxylic compound which have been processed with heat in a shear field to advance the composition to the stage where further heating will evolve less than 2 percent of the initial weight as volatiles. The product molding powder displays little or no tendency to blister, swell, or distort during molding and post-curing.

3,792,021

PROCESS FOR CROSSLINKING HYDROPHILIC COLLOIDS USING ACROLEIN DERIVATIVES SUBSTITUTED BY AN ONIUM GROUP

Paul Tschopp, Marly, Werner Deuschel, Villars sur Glane, Carlo Boragine, Fribourg, and Rainer Kitzing, Villars sur Glane, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Filed July 7, 1971, Ser. No. 160,563

Claims priority, application Switzerland, July 7, 1970, 10,299/70

Int. Cl. C08f *3/34;* C09h *7/00*

U.S. Cl. 260—73 R **8 Claims**

A process for crosslinking hydrophilic colloids containing amino, imino and/or hydroxyl groups by means of acrolein derivatives substituted by an onium group in the p-position as well as photographic material containing in at least one layer on a support a crosslinked hydrophilic colloid are described.

3,792,022

PERFLUORO ADDITION POLYMERS

Robert J. Jones, Hermosa Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

No Drawing. Filed Oct. 27, 1972, Ser. No. 301,454

Int. Cl. C08g *22/00*

U.S. Cl. 260—77.5 AM **9 Claims**

Highly stable structural polymers are made by reacting a perfluoro vinyl containing reactant with difluoromaleic anhydride in the presence of a catalyst. These linear perfluoro polymers may be modified by including in the

backbone chain a perfluoro compound having a pendant oxy structure. Further modification may be obtained by including amine terminated or diisocyanate terminated perfluoro cross-linking compounds. Polymerization by simple addition reaction is made to occur by the application of peroxide catalyst. These linear perfluoro polymers may be used for applications as seals, sealants, films, coatings, and fibers.

3,792,023

PROCESS FOR THE PRODUCTION OF STORAGE-STABLE POLYURETHANE ISOCYANATES

Lothar Havenith, Dietrich Liebsch, and Joachim Zirner, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Continuation-in-part of abandoned application Ser. No. 30,985, Apr. 22, 1970. This application June 23, 1972, Ser. No. 265,907

Claims priority, application Germany, May 3, 1969, P 19 22 626.7

Int. Cl. C08g *22/16*

U.S. Cl. 260—77.5 AQ **4 Claims**

A process is provided for the production of polyurethane isocyanates which are stable on storage, which dry quickly in the presence of atmospheric moisture and which contain tertiary nitrogen atoms by reacting aromatic diisocyanates or polyisocyanates with polyether alcohols with an NCO/OH ratio of at least 1.57, wherein the polyether alcohols used are of the kind which contain at least one tertiary nitrogen atom with at least five and preferably more than ten ether groups between the tertiary nitrogen atom and the hydroxyl group.

3,792,024

POLYMERIZATION OF BENZIMIDAZOBENZOPHENANTHROLINE-LADDER POLYMER

Lowell Saferstein, Plainfield, N.J., assignor to Celanese Corporation, New York, N.Y.

No Drawing. Filed July 27, 1972, Ser. No. 275,596

Int. Cl. C08g *20/32*

U.S. Cl. 260—78 TF **14 Claims**

An improved method of forming a benzimidazobenzophenanthroline-ladder polymer is disclosed. An organic tetraamine (e.g., 1,2,4,5-tetraaminobenzene) and a tetracarboxylic acid dianhydride (e.g., 1,4,5,8-naphthalene dianhydride) are reacted in a polyphosphoric acid solvent in the presence of a catalytically effective amount of a metal cation-containing Lewis Acid (e.g., antimony trichloride) to form the polymer.

3,792,025

NOVEL COMPOUNDS AND PROCESS

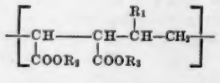
Henri Ulrich, Northford, Fred A. Stuber, North Haven, and Allen J. Broggi, Branford, Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Dec. 15, 1972, Ser. No. 315,303

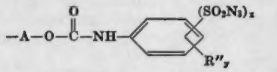
Int. Cl. C08f *27/08;* **C08g** *33/00*

U.S. Cl. 260—78.5 T **4 Claims**

Hydrophobic radiation-sensitive polymers are provided which are characterized by the recurring unit:



wherein R_1=lower-alkoxy or phenyl, one of R_2 and R_3 is hydrogen and the other is



wherein A=alkylene (C_{12-20}), R″=lower alkyl or halogen, x=1 or 2, y=0, 1 or 2, $x+y\leq 3$. Salts of the above compounds are disclosed as well as modifications of the above polymers in which some recurring units contain tertiary amino groups.

The polymers are useful in the preparation of photoresists having high resistance to attack by acid etchants. The polymers are also useful in production of lithographic plates and the like which are to be used with oleophilic inks.

3,792,026

HIGH MOLECULAR WEIGHT OLEFIN POLYSULFONE RESINS AND PROCESS FOR THEIR PREPARATION

Bobby Leroy Atkins, William Marvin Welsh, and William Ross Moore, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of abandoned application Ser. No. 693,150, Dec. 26, 1967. This application Sept. 8, 1970, Ser. No. 70,537

Int. Cl. C08f *13/06*

U.S. Cl. 260—79.3 A **10 Claims**

A process for the suspension polymerization of sulfur dioxide and alpha-monoolefinic monomers in water with a suspending agent is described. The resultant high molecular weight copolymers are useful as water repellant coatings for metals, concrete and fabrics. The copolymers are characterized by the fact that they have a peak molecular weight in the range 1.5×10^5 to 2.5×10^6.

3,792,027

NOVEL COPOLYMERS

Hans Peter Panzer, Stamford, William Charles Firth, Jr., Wilton, Anthony Thomas Coscia, South Norwalk, and Lucille Elma Palmer, Darien, Conn., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Apr. 14, 1971, Ser. No. 134,057

Int. Cl. C08f *13/06*

U.S. Cl. 260—73 R **4 Claims**

A novel class of acrylamide-sulfur dioxide polymers, a method for their production, glyoxal reaction products thereof and paper treated with said reaction products, are disclosed.

3,792,028

HYDROPHILIC GEL POLYMERS OF VINYL PYRROLIDONE AND HYDROXYL ALKYL METHACRYLATE

Maurice Seiderman, 3306 Deronda Drive, Hollywood, Calif. 90028

No Drawing. Continuation-in-part of application Ser. No. 92,280, Nov. 23, 1970, now Patent No. 3,721,657, which is a continuation-in-part of application Ser. No. 845,499, July 28, 1969, now Patent No. 3,639,524. This application Dec. 30, 1971, Ser. No. 214,418

The portion of the term of the patent subsequent to Mar. 20, 1990, has been disclaimed

Int. Cl. C08f *17/00*

U.S. Cl. 260—80.72 **8 Claims**

A plastic or resin product is obtained by mixing a comminuted pyrrolidone such as polyvinylpyrrolidone, and

optionally modifiers and additives such as organic methacrylates, and optionally crosslinking agents, and optionally catalysts, and causing polymerization to take place. The inventive product is insoluble in water but is hydratable with water, depending upon the proportions of the above mentioned components, and may take up in its structure as little as 5% by weight of water to as high as 90% by weight of water. The inventive hydrated product is optionally transparent, translucent, or opaque, and produced in any shape or size, depending only on the mold in which it is cast. The transparent product is especially suitable for contact lenses. The translucent and opaque products may be fabricated into membranes with pore sizes that can be made selectively, or cast into useful shapes and for other uses.

3,792,029

PRODUCTION OF COPOLYMERS

Lubor Roubinek, London, and Theodore Roger Ernest Kressman, Watford, England, assignors to The Permutit Company Limited, London, England

No Drawing. Filed Mar. 8, 1971, Ser. No. 122,207

Claims priority, application Great Britain, Mar. 17, 1970, 12,849/70

Int. Cl. C08f *1/11*

U.S. Cl. 260—88.2 C **9 Claims**

In the suspension polymerization of a mixture of two unequally reactive monomers, such as styrene and divinyl benzene, in a suspension medium containing a stabilizer which forms films on globules of the monomer mixture, the proportion of the more reactive monomer in the unreacted mixture in the globules tends to decrease continuously, so that the resultant beads are not homogeneous in composition. The invention improves the homogeneity by adding more monomer mixture in the form of an emulsion as the polymerization proceeds, the emulsion containing a progressively increasing proportion of the more reactive monomer. To enable the emulsified monomers to enter to globules, the stabilizer films are kept thin.

3,792,030

PROCESS FOR THE POLYMERIZATION OF 1,2-DIMETHOXYETHYLENE

Norbert Vollkammer, Troisdorf, and Wilhelm Vogt, Cologne, Germany, assignors to Dynamit Nobel AG, Troisdorf, Germany

No Drawing. Filed Dec. 13, 1971, Ser. No. 207,648

Claims priority, application Germany, Dec. 18, 1970, P 20 62 400.4

Int. Cl. C08f *3/34*

U.S. Cl. 260—91.1 R **8 Claims**

A process for the polymerization of 1,2-dimethoxyethylene using halogen containing organo aluminum compounds as polymer initiators is disclosed. The present process enables the preparation of polydimethoxyethylenes having molecular weights in excess of 60,000.

3,792,031

PROCESS FOR IMPROVED ELASTOMERS

Anne C. Udding, Amsterdam, Netherlands, assignor to Shell Oil Company, New York, N.Y.

No Drawing. Filed Feb. 22, 1972, Ser. No. 228,231

Claims priority, application Netherlands, June 23, 1971, 7108691

Int. Cl. C08d *5/02*

U.S. Cl. 260—94.7 N **8 Claims**

A process for the modification of elastomeric isoprene polymers into products which can be processed together with a filler to unvulcanized compositions having improved "green strength" comprises reacting such an isoprene polymer with from about 0.01 to about 5% by weight of a mononitrone at a temperature from about 60° C. to about 200° C.

3,792,032

POLYPEPTIDES RELATED TO THE C-TERMINAL HEPTAPEPTIDE OF BOMBESIN AND ALYTESIN

Luigi Bernardi, Roberto de Castiglione, Gian Carlo Fregnan, and Onofrio Goffredo, Milan, Italy, assignors to Societa Farmaceutical Italia, Milan, Italy

No Drawing. Filed Aug. 14, 1970, Ser. No. 63,906

Claims priority, application Italy, July 31, 1970, 28,126/70

Int. Cl. C07c *103/52*

U.S. Cl. 260—112.5 **19 Claims**

Polypeptides of the formula

X—Trp—Ala—Val—Gly—His—Leu—Met—NH_2

wherein X is selected from the group consisting of hydrogen, an acyl radical of a carboxylic acid, of an aminoacid, of a dipeptide, its protected derivatives and its salts.

The polypeptides display an activity on the systemic pressure and a stimulating activity on the uterus, colon, ileum and gastric secretion and a hyperglycemic action.

3,792,033

ACTH-TYPE HORMONES WHOSE FIRST AMINOACID IS OF D-CONFIGURATION

Beat Iselin, Riehen, Heini Kappeler, Wuerenlos, Bernhard Riniker, Frenkendorf, and Werner Rittel, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 667,078, Sept. 12, 1967, which is a continuation-in-part of application Ser. No. 592,745, Nov. 8, 1966, which in turn is a continuation-in-part of application Ser. No. 478,409, Aug. 9, 1965, all now abandoned. This application May 6, 1969, Ser. No. 822,327

Int. Cl. C07c *103/52*

U.S. Cl. 260—112.5 **29 Claims**

Adrenocorticotropically active peptides containing 16 to 39, especially 18 to 25 aminoacid residues and having as the first aminoacid at the aminoend a D-aminoacid.

In these peptides some aminoacids of the natural sequence may have been exchanged for others, provided that the ACTH-activity remains substantially unaffected as is the case, for example, when the second aminoacid, tyrosine, is replaced by phenylalanine. Also the first aminoacid—which according to the invention is present in the D-configuration (or as the racemic D,L-acid)—may be the D-form of a natural α-aminoacid other than serine, above all, for example, D-alanine, D-proline or D-threonine. Of the new peptides, special mention is deserved by those which contain 18–25 aminoacids, but differ from the sequence of the first 18 to 25 aminoacids to ACTH in that the first aminoacid is D-serine, and particularly those in which the first aminoacid is D-serine and in which the arginine ^{17,18}-radicals are replaced by ornithine or lysine radicals and/or the serine^{3}-radical is replaced by glycyl, and/or the glutamyl^{5}-radical by glutaminyl. The new peptides have an enhanced adrenocorticotropic activity.

3,792,034

TRIPEPTIDE AND ACID ADDITION SALTS

Walter Boguth, Riehen, Rolf Studer, Bottmingen, and Ute Achterrath and Hans Kunzi, Riehen, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Mar. 29, 1972, Ser. No. 239,358

Int. Cl. C07c *103/52*

U.S. Cl. 260—112.5 **2 Claims**

L-pyroglutamyl-2,5-diiodo-L-histidyl-L-prolinamide and its acid addition salts are active as thyroidal agents, such as

for example, in the treatment of hyperthyreosis. The iodinated tripeptide is conveniently prepared by iodinating 1-pyroglutamyl-L-histidyl-L-prolinamide.

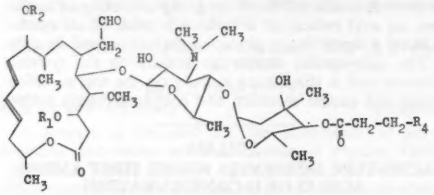
3,792,035

MONO-ACETYL DERIVATIVES OF ANTIBIOTIC SF–837 AND SF–837-A_2 SUBSTANCES AND PRODUCTION THEREOF

Shunzo Fukatsu, Tokyo, Tetsuo Ishikawa, Taro Miuro, and Taro Niida, Yokohama, Bunzo Nomiya, Tokyo, and Takemi Koeda, Yokohama, Japan, assignors to Meji Seika Kaisha, Ltd., Tokyo, Japan

Filed Apr. 21, 1971, Ser. No. 135,858
Claims priority, application Japan, May 4, 1970, 45/37,456
Int. Cl. C07c *129/18*
U.S. Cl. 260—210 AB **3 Claims**

New mono-acetates of antibiotics SF–837 substance and SF–837–A_2 substance represented by the formula



where R_1 is a propionyl group, R_2 is an acetyl group, and R_4 is hydrogen atom or methyl group, may be produced by partially hydrolyzing under non-acidic conditions the di-acetates of SF–837 substance and SF–837–A_2 substance, respectively, which have been derived by acetylating the SF–837 substance and SF–837–A_2 substance in the form of the free bases as prepared through the cultivation of *Streptomyces mycarofaciens* identified as ATCC No. 21454. The mono-acetates of the SF–837 and SF–837–A_2 substances are much more excellent as the anti-bacterial agent than their corresponding free bases and di-acetates.

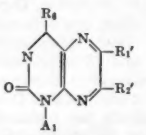
3,792,036

PTERIDINE-GLYCOSIDES

Wolfgang Pfleiderer, Constance, Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Dec. 24, 1970, Ser. No. 101,391
Claims priority, application Sweden, Jan. 7, 1970, 140/70; Nov. 18, 1970, 17,021/70
Int. Cl. C07c *51/50, 95/04*
U.S. Cl. 260—211.5 R **7 Claims**

Compounds selected from the group consisting of amines of the Formula V



(V)

wherein A_1 stands for a member selected from 1-aldopentosidyl, 1-aldohexosidyl, mono-desoxygenated 1-adopentosidyl, mono-desoxygenated 1-aldohexosidyl, said radicals with free hydroxyl groups, and said radicals with hydroxyl groups esterified by lower alkanoyl, aroyl and said radicals with hydroxyl groups etherified by aryl-lower alkyl, R_1' and R_2' each stands for a member selected from hydrogen, lower alkyl, phenyl, lower alkyl phenyl, lower alkoxy phenyl, halogeno phenyl and trifluoromethyl phenyl, and R_6 stands for a member selected from hydroxy, lower alkoxy, mercapto, lower alkylmercapto, free amino, mono-lower alkylamino and di-lower alkylamino, and their salts are useful as antibacterial agents, especially as agents which are active against viruses. They are obtained by new methods or by methods known per se.

3,792,037

PROCESS FOR PREPARING AMBUTYROSIN

Hiroshi Kawaguchi, Tokyo, Masataka Konishi, Tokohama, and Hiroshi Tsukiura, Tokyo, Japan, assignors to Bristol-Myers Company, New York, N.Y.

No Drawing. Filed Nov. 4, 1971, Ser. No. 195,804
Int. Cl. C07c *47/18*
U.S. Cl. 260—210 R **2 Claims**

The specification discloses a process for preparing ambutyrosin by a semisynthetic procedure comprising the steps of acylating 5-β-D-xylofuranosylneamine or 5-β-D-ribofuranosylneamine.

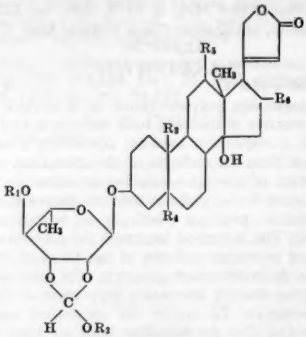
3,792,038

CARDIO-ACTIVE CARDENOLIDE RHAMNOSIDES

Johannes Hermann Hartenstein, Wittental, Gerhard Satzinger, Denzlingen, and Manfred Franz Herrmann, Gundelfingen, Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

No Drawing. Filed Apr. 9, 1973, Ser. No. 349,513
Int. Cl. C07c *173/02*
U.S. Cl. 260—210.5 **5 Claims**

The present invention relates to new cardio-active cardenolide rhamnosides of the General Formula I



(I)

wherein R_1 represents hydrogen, methyl, ethyl, or the acyl residue of a carboxylic acid having from 1 to 4 carbon atoms, the acyl residue being substituted by a methoxy or ethoxy group, if present, R_2 represents a lower alkyl residue, R_3 represents methyl, formyl, or hydroxymethyl, R_4 represents hydrogen or hydroxyl, and R_5 and R_6 represent hydrogen, hydroxyl or acetoxy.

3,792,039

POLY 2'-FLUORO-2'-DEOXYURIDYLIC ACID

Robert Joseph Erickson, Michael Paul Kotick, Lawrence Francis Reverman, and Dan P. Wilson, Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

No Drawing. Filed Dec. 27, 1971, Ser. No. 212,619
Int. Cl. C07d *51/52*
U.S. Cl. 260—211.5 R **2 Claims**

The synthesis and enzyme inhibition properties of poly 2'-fluoro-2'-deoxyuridylic acid (poly dUfl) is disclosed.

3,792,040

ACYL DERIVATIVES OF O^2,2' - ANHYDRO-1-(β-D-ARABINOFURANOSYL)-CYTOSINES AND METHODS OF PREPARING

John G. Moffatt, Los Altos, and Alan F. Russell, San Francisco, Calif., assignors to Syntex Corporation, Panama, Panama

No Drawing. Continuation-in-part of application Ser. No. 21,206, Mar. 19, 1970, now Patent No. 3,709,874. This application Mar. 3, 1972, Ser. No. 231,753
The portion of the term of the patent subsequent to Jan. 9, 1990, has been disclaimed
Int. Cl. C07d *51/52*
U.S. Cl. 260—211.5 R **10 Claims**

3'-O-acyl and 3'-O-acyl-5'-O-acyl-derivatives of the salts of O^2,2'-anhyro-1-(β-D-arabinofuranosyl)-cytosines and

methods of preparing such compounds. The compounds are further characterized in that each compound has a higher acyl group at the 3′-O-position and/or the 5′-O-position. The compounds can be prepared by reacting the corresponding 1-(β-D-ribofuranosyl) cytosine with a suitable α-acyloxyacyl halide having the desired acyl substituent. The compounds are isolated and recovered as pharmaceutically acceptable salts and exhibits anti-viral, cytotoxic and anti-neoplastic activity, and thus are useful for the treatment of mammals where such agents are indicated. The compounds are also useful as intermediates for preparing the corresponding 1-(β-D-arabinofuranosyl)-cytosines.

3,792,041

PROCESS FOR SYNTHESIZING SUCROSE ESTERS OF FATTY ACIDS

Fumiaki Yamagishi, Fumio Endo, Hideki Ooi, and Yoshio Kozuka, Kyoto, Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Oct. 23, 1970, Ser. No. 83,506
Claims priority, application Japan, Oct. 23, 1969, 44/85,110
Int. Cl. C07c *69/32*
U.S. Cl. 260—234 R **10 Claims**

The improved process for synthesizing sucrose esters of fatty acids comprises the steps of:

(a) preparing a solution of the mixture of sucrose and a fatty acid soap with water, said sucrose being completely dissolved in said solution;

(b) adding to said solution of the mixture a fatty acid ester and a catalyst for the transesterification reaction between sucrose and said fatty acid ester under such temperature elevating and pressure reducing conditions as to avoid hydrolysis of said fatty acid ester in order to form a substantially completely dehydrated, homogeneous melt composition; and

(c) carrying out the transesterification reaction between sucrose and said fatty acid ester in said melt composition at a temperature within the range of 110° to 175° C.

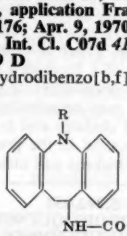
3,792,042

DIHYDRODIBENZO[b,f]AZEPINE DERIVATIVES

Jean Fouché, Bourg-la-Reine, and André Leger, Massy, France, assignors to Rhone-Poulenc S.A., Paris, France

No Drawing. Filed June 22, 1970, Ser. No. 48,450
Claims priority, application France, June 24, 1969, 6921176; Apr. 9, 1970, 7012838
Int. Cl. C07d *41/08*
U.S. Cl. 260—239 D **8 Claims**

New 10,11-dihydrodibenzo[b,f]azepines of the formula:



wherein R represents hydrogen or alkyl of 1 through 5 carbon atoms, and R_1 represents alkyl of 1 through 7 carbon atoms, are useful fungicides.

3,792,043

PROCESS FOR CONVERTING COMPOUNDS CONTAINING A CYCLIC SULFUR GROUP TO ALDEHYDES OR KETONES

Hsin-Lan Wang Chang, Piscataway, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

No Drawing. Filed Dec. 2, 1971, Ser. No. 204,303
Int. Cl. C07c
U.S. Cl. 260—239.55 D **9 Claims**

Compounds having a 1,3-dithiolane, 1,3-dithiane, 1,3,5-oxadithiane or 1,3,5-trithiane substituent are converted to aldehyde or ketones by treating with certain organic halides or sulfates.

3,792,044

METHOD FOR DETERMINING GLUCOSE WITH o-TOLUIDINE REAGENT CONTAINING AN ARSENIC COMPOUND

Joseph F. Dooley, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

No Drawing. Filed Dec. 1, 1971, Ser. No. 203,840
The portion of the term of the patent subsequent to Dec. 11, 1990, has been disclaimed
Int. Cl. G01n *21/06, 33/16*
U.S. Cl. 23—230 B **4 Claims**

A diagnostic composition containing o-toluidine, thiourea and an oxide of arsenic is used for the quantitative determination of glucose in the body fluids of humans.

3,792,045

PROCESS FOR THE PURIFICATION OF LACTAMS

Ruthild Henn, Domat-Ems, Grisons, and Dirk Deiters, Hans-Joachim Schultze, and Clau Berther, Chur, Grisons, Switzerland, assignors to Inventa AG fur Forschung und Patentverwertung, Zurich, Switzerland

No Drawing. Filed Dec. 22, 1971, Ser. No. 211,102
Claims priority, application Switzerland, Jan. 6, 1971, 99/71
Int. Cl. C07d *41/06*
U.S. Cl. 260—239.3 A **14 Claims**

A process characterized in that raw caprolactam is subjected, in either sequence, to a crystal extraction with an aliphatic or cycloaliphatic hydrocarbon having 5–10 carbon atoms and to distillation under reduced pressure.

3,792,046

PROCESS OF PREPARATION OF 16β-METHYL-9α-FLUORO-STEROIDS

Ivan Villax, 3 Travessa do Ferreiro, Lisbon, Portugal

No Drawing. Filed Aug. 7, 1972, Ser. No. 278,394
Claims priority, application Portugal, Dec. 13, 1969, 52,923
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 R **9 Claims**

Process for preparing betamethasone and its 21-ester derivatives by simultaneously 11β-hydroxylating and 9-brominating 16β-methyl-17α-hydroxy-1,4,9(11)-pregnatriene-3,20-dione, dehydrobrominating the resultant 16β-methyl-9α-bromo-11β,17α-dihydroxy - 1,4 - pregnadiene-3,20-dione in an alkaline medium to obtain the 9,11-epoxy compound, fluorinating the epoxy compound to yield 16β-methyl-9α-fluoro-11β,17α-dihydroxy-1,4-pregnadiene-3,20-dione, diiodinating the latter compound at the 21-position, acylating the 21-diiodo compound to produce the 21-acylate, and hydrolyzing the acylate.

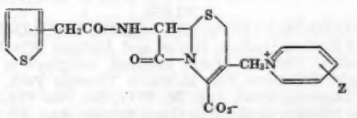
3,792,047

N-(7,2′ - THIENYLACETAMIDOCEPH - 3-EM-3-YLMETHYL)-3″ OR 4″-N-HYDROXYLOWER-ALKYLCARBAMOYL-PYRIDINIUM - 4-CARBOXYLATES

Vincent Arkley, Colombo, Ceylon, and Stephen Eardley, Southport, and Alan Gibson Long, Greenford, England, assignors to Glaxo Laboratories Limited, Greenford, England

No Drawing. Continuation-in-part of application Ser. No. 329,212, Dec. 9, 1963. This application Dec. 7, 1971, Ser. No. 205,743
Int. Cl. C07d *99/24*
U.S. Cl. 260—243 C **3 Claims**

Compounds of the formula



in which Z is N-(hydroxylower alkyl)-carbamoyl. Of particular importance are N-(7-2′-thienylacetamidoceph-3-em-3-ylmethyl)-3″-N-hydroxymethylcarbamoyl - pyridinium-4-carboxylate and N-(7 - 2′ - thienylacetamidoceph-3-

em-3-ylmethyl)-4''-N-hydroxymethyl carbamoyl-pyridinium-4-carboxylate which are especially suited as long-acting antibiotics giving unusually prolonged serum levels following injection.

3,792,048

PROCESS FOR HYDROLYZING 3-TRIFLUOROMETHYL PHENETHYLAMINES

Nikolaus R. Hansl, Omaha, Nebr., assignor to Pacific Research Laboratories, Santa Barbara, Calif.

No Drawing. Filed Oct. 29, 1970, Ser. No. 85,283
Int. Cl. C07d 87/36
U.S. Cl. 260—247.2 R 8 Claims

This disclosure relates to a process for hydrolyzing 3-trifluoromethyl phenethylamines to yield the corresponding benzoic acid derivatives. The process is conducted in the presence of an acid, most preferably sulfuric acid in the liquid phase. The benzoic acid compounds produced are intermediates useful in the preparation of m-substituted amino ethyl benzoic acid esters which are active as spasmolytics and psychotherapeutic agents.

3,792,049

2-GUANIDINO-4,6-BIS-AMINO-S-TRIAZINES

Denis Varsanyi, Arlesheim, and Willy Roth, Aargau, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 111,656, Feb. 1, 1971, which is a continuation-in-part of application Ser. No. 672,712, Oct. 4, 1967, both now abandoned. This application Feb. 17, 1971, Ser. No. 116,234
Claims priority, application Switzerland, Oct. 27, 1966, 15,589/66
Int. Cl. C07d 55/22
U.S. Cl. 260—249.6 8 Claims

Novel waxy, monobasic amines disubstituted at the amino nitrogen atom by a 2-guanidino-4-amino-s-triazinyl-(6) group and a 2,4-bis-amino-triazinyl-(6) group or by two 2-guanidino-4-amino-s-triazinyl-(6) groups, are described, in the molecule of which novel compounds the aforesaid guanidino substituent is of the formula

wherein each of Y_1 and Y_2 as well as each of the substituents in free positions at carbon atoms of the s-triazine nuclei are amino groups substituted by one or two organic radicals or are certain heterocyclic radicals, preferably at least one of the substituents of amino nitrogen atoms in the molecule being a long chain organic radical of at least 10 and up to 22 carbon atoms; the novel compounds have wax-like properties and are useful as components in novel floor care agents, especially in combination with conventional ingredients in compositions for the treatment of floor surfaces, such as natural and synthetic waxes, resins, silicones, inorganic and organic fillers, detergents and other surfactants, pigments, stabilizing agents and the like conventional adjuvants; the aforesaid novel s-triazine derivatives afford to the treated surfaces, among other advantages, high gloss and/or satisfactory antislip effects. They are also useful as waxy components in automobile polishes and in copying layers on carbon paper.

3,792,050

2-OXO-2H-PYRIMIDO[2,1-a]ISOQUINOLINE

Harold Francis Hodson, Hayes, and Anthony Winchester Randall, West Wickham, England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

No Drawing. Filed Aug. 26, 1971, Ser. No. 175,329
Claims priority, application Great Britain, Aug. 27, 1970, 41,402/70; Nov. 30, 1970, 56,781/70
Int. Cl. C07d 51/46
U.S. Cl. 260—251 A 6 Claims

The compounds 3,4-dihydro-2-oxo-2H-pyrimido{2,1-a} isoquinoline and 3,4,6,7-tetrahydro-2-oxo-2H-pyrimido {2,1-a}isoquinoline and acid addition salts thereof; pharmaceutical compositions containing them; and methods of preparing the compounds, salts and pharmaceutical compositions. The compounds, salts and compositions are useful in the treatment of arthritis.

3,792,051

PERYLENE-3,4,9,10-TETRACARBOXYLIC ACID-BIS-(2-IMIDO-4-METHYLPYRIMIDINE)

Fritz Graser, Ludwigshafen, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Mar. 17, 1972, Ser. No. 235,657
Claims priority, application Germany, Apr. 2, 1971, P 21 16 048.5
Int. Cl. C07d 51/42
U.S. Cl. 260—256.4 N 1 Claim

Perylene-3,4,9,10-tetracarboxylic acid - bis-(2-amido-4-methylpyrimidine) which is useful as a pigment having very good fastness properties.

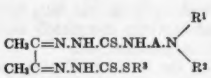
3,792,052

HYDRAZINECARBODITHIOATE DERIVATIVES AND METAL CHELATES THEREOF

Brian William Sharp, Hornchurch, Dennis Warburton, Upminster, and Kenneth Robert Harry Wooldridge, Brentwood, England, assignors to May & Baker Limited, Dagenham, Essex, England

No Drawing. Filed Nov. 17, 1970, Ser. No. 90,446
Claims priority, application Great Britain, Nov. 18, 1969, 56,500/69
Int. Cl. C07d 27/04
U.S. Cl. 260—268 R 14 Claims

The new hydrazinecarbodithioate derivatives of the formula:



wherein each of R^1 and R^2 represents alkyl, aryl or aralkyl, cycloalkyl of 5 through 8 carbon atoms, or cycloalkylalkyl in which the cycloalkyl moiety contains 5 through 8 carbon atoms and the alkyl moiety contains 1 through 4 carbon atoms, or R^1 represents alkanoyl and R^2 is as hereinbefore defined, or R^1 and R^2 together with the nitrogen atom to which they are attached form a saturated or partially saturated three through eight-membered heterocyclic group, R^3 represents alkyl of 1 through 4 carbon atoms, which may be substituted by at least one alkoxy group of 1 through 4 carbon atoms, and A represents a divalent polymethylene group of 2 through 4 carbon atoms, which may be substituted by at least one alkyl group, and metal chelates and non-toxic acid addition salts thereof, are useful in the prevention and treatment of coccidiosis in chickens and turkeys.

3,792,053

3-(1,2,3,4-TETRAHYDROISOQUINOLINOMETHYL)-3-QUINUCLIDINOL

John R. Potoski, Rosemont, and Meier E. Freed, Paoli, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Original application July 15, 1970, Ser. No. 55,264, now Patent No. 3,725,410, dated Apr. 3, 1973. Divided and this application Aug. 7, 1972, Ser. No. 278,663
Int. Cl. C07d 33/10
U.S. Cl. 260—288 R 1 Claim

This invention is concerned with new and novel derivatives of 3-aminomethyl - 3 - quinuclidinols which are pharmacologically active as CNS depressants useful in the calming of animals. Further, this invention is concerned with methods of producing the new and novel 3-aminomethyl-3-quinuclidinols. Still further, this invention is concerned with 3-methylenequinuclidine oxide which is a new and novel intermediate useful in the production of

the new and novel 3-aminomethyl-3-quinuclidinol derivatives of the present invention.

3,792,054

DIACYLOXY-BENZOIC ACID ANILIDES

Heinrich Rushig, Bad Soden, Taunus, Dieter Duwel, Hofheim, Taunus, and Johann Konig, Niederhofheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

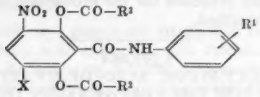
No Drawing. Original application June 5, 1970, Ser. No. 43,949. Divided and this application May 31, 1972, Ser. No. 258,431

Claims priority, application Germany, June 9, 1969, P 19 29 150.0

Int. Cl. C07d *29/30*

U.S. Cl. 260—293.64 **5 Claims**

Diacyloxy-benzoic acid anilides of the general formula



(I)

in which

X represents hydrogen or halogen,

R^1 represents 1 to 3 nitro groups, trifluoromethyl groups and/or halogen atoms,

R^2 represents hydrogen; lower alkyl which may be substituted by halogen, lower alkoxy or phenyl; alkenyl having 3 to 6 carbon atoms; cycloalkyl having 4 to 6 carbon atoms; phenyl; an unsaturated heterocyclic 5- or 6-membered ring; alkyl-amino or dialkyl-amino in which the alkyl groups each contain 1 to 4 carbon atoms or may form together with the nitrogen atom a pyrrolidine, piperidine, morpholine or N-methyl-piperazine ring.

3,792,055

HETEROCYCLIC AMIDES

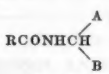
Yoshio Suzuki, Amagasaki, Shunji Aono, Toyonaka, and Hideaki Fukushima, Nishinomiya, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

No Drawing. Original application Aug. 29, 1969, Ser. No. 854,308, now Patent No. 3,666,774. Divided and this application Oct. 6, 1971, Ser. No. 187,155

Int. Cl. C07d *31/44*

U.S. Cl. 260—295 AM **5 Claims**

A novel fatty acid amide useful as an anti-arteriosclerotic agent which is represented by the formula,



wherein R represents a saturated or unsaturated straight or branched aliphatic hydrocarbon group having 15 to 25 carbon atoms which may bear a hydroxyl group, A represents a lower alkyl group, aryl group or aralkyl group and B represents a hetero-cyclic radical containing a nitrogen, oxygen or sulfur atom, such as, for example, α-(thienyl or pyridyl)-ethyl or benzyl amide of linoleic acid, isostearic acid, linolenic acid, oleic acid or safflower oil. These compounds are prepared by reacting the appropriate fatty acid or reactive derivative with an amine of the formula,

These compounds may be incorporated in foodstuffs or ingested with a suitable carrier.

3,792,056

BRIGHTENING PLASTICS WITH 2-ARYL-5-CYANONAPHTHOXAZOLE BRIGHTENERS

Bennett George Buell, Bound Brook, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Original application Apr. 13, 1970, Ser. No. 28,146, now Patent No. 3,660,125. Divided and this application Aug. 26, 1971, Ser. No. 175,349

Int. Cl. C07d *85/48*

U.S. Cl. 260—307 D **2 Claims**

Translucent plastics, particularly polyvinyl chloride, cellulose acetate, and polyolefins such as polyethylene are brightened by distributing uniformly therethrough about 0.01% to 0.5% by weight of a 2-aryl-5-cyanonaphthoxazole wherein the 2-aryl moiety is naphthyl, styrylphenyl, anisoylaminophenyl, carboxybenzoylaminophenyl, phenylureidophenyl or acylaminophenyl in which the acyl group is the residue of a higher fatty acid.

3,792,057

SUBSTITUTED INDENOIMIDAZOLES

Norman P. Jensen, Watchung, and Tsung-Ying Shen and Thomas B. Windholz, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed May 14, 1971, Ser. No. 143,665

Int. Cl. C07d *49/36*

U.S. Cl. 260—309 **3 Claims**

New indenoimidazoles useful in the inhibition of phenylethanolamine-N-methyl transferase.

3,792,058

2-(p-ACETAMINOPHENOXY)-TETRAHYDROPYRAN

Arnold John Repta, Lawrence, Kans., assignor to Warner-Lambert Company, Morris Plains, N.J.

No Drawing. Filed Aug. 11, 1972, Ser. No. 279,900

Int. Cl. C07d *7/04*

U.S. Cl. 260—345.7 **1 Claim**

A relatively tasteless form of p-acetaminophen which is rapidly released under acid conditions in the gastrointestinal tract is obtained by forming an acylal with tetrahydropyran.

3,792,059

CONTINUOUS PROCESS OF PRODUCING NON-AROMATIC TIN HALIDES THE ORGANIC GROUP HAVING NOT MORE THAN FIVE CARBON ATOMS

Ingenuin Hechenbleikner, West Cornwall, Conn., assignor to Weston Chemical Corp., Division of Borg Warner Corp., Chicago, Ill.

Filed Feb. 24, 1972, Ser. No. 228,831

Int. Cl. C07f *7/22*

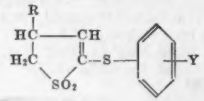
U.S. Cl. 260—429.7 **12 Claims**

A continuous process of producing non-aromatic tin halides of not more than five carbon atoms in each organic group, such as alkyltin halides. To simplify the abstract, references will be made to the preferred alkyltin halides. In the process two columns are used. In the first, metallic tin with a large surface, such as tin granules, foil and the like, moves down through the column with a liquid catalyst which is an onium compound prepared by complexing trivalent nitrogen compounds or phosphorus compounds with alkyl halides. At the bottom of the tower alkyl halides are pumped in and flow up, reacting with the tin to form alkyltin compounds, which leave the top of the column and are separated from the onium catalyst by fractional distillation in a second column. The catalyst, carrying dissolved or complexed a small amount of alkyltin halide, is recirculated. There are two variants, one in which the catalyst consists of the onium compound only and the second where there is also present an iodine compound. Without the iodine compound the reaction is somewhat slower, but the cost of the iodine compound is eliminated, so that the choice is an economic one. In both cases the yields of alkyltin compounds are very high and often approach quantitative. The tin compounds are

mixtures of monoalkyltin trihalides, dialkyltin dihalides, trialkyltin halides, and tetraalkyltin. The relative proportions of each type of product depends upon the type of catalyst, the temperature of the reaction, and the rate of flow through the apparatus. Under usual conditions, the main product will be dialkyltin dihalides.

3,792,060
2-PHENYLTHIO-4,5-DIHYDROTHIOPHENES
Douglas I. Relyea, Pompton Plains, and Richard J. Sperley, Wayne, N.J., and Ronald B. Ames, Naugatuck, Conn., assignors to Uniroyal, Inc., New York, N.Y.
No Drawing. Original application Oct. 30, 1967, Ser. No. 679,150, now Patent No. 3,563,725, dated Feb. 16, 1971. Divided and this application Sept. 16, 1970, Ser. No. 72,828
Int. Cl. C07d *63/08*
U.S. Cl. 260—332.1 **2 Claims**

New compounds, useful as herbicides, and a method of making them, are disclosed. The compounds have the general formula:



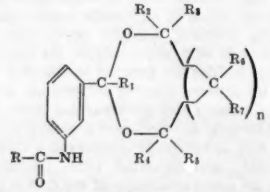
wherein R is hydrogen, chlorine or methyl and Y is hydrogen, an alkyl group of 1 to 8 carbon atoms, chlorine or bromine.

3,792,061
PROCESS FOR THE PRODUCTION OF IMIDOCARBOXYLIC ACIDS
Wilfried Zecher, Cologne, and Rudolf Merten, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Sept. 10, 1970, Ser. No. 71,253
Claims priority, application Germany, Sept. 16, 1969, P 19 46 788.0
Int. Cl. C07d *27/52*
U.S. Cl. 260—326 N **10 Claims**

Process for the production of imidocarboxylic acids by reaction of a cyclic dicarboxylic anhydride and a polyamide at a temperature of from 20 to 450° C. The products obtained are suitable for the production of plasticizers and lacquers.

3,792,062
ANILIDE DIOXOLANES AND DIOXANES AND THEIR UTILITY AS HERBICIDES
Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Company, New York, N.Y.
No Drawing. Filed Oct. 26, 1971, Ser. No. 192,483
Int. Cl. C07d *13/04, 15/04*
U.S. Cl. 260—340.7 **49 Claims**

Substituted anilide dioxolanes and dioxane compounds having the formula



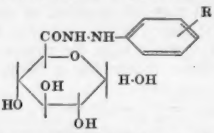
in which R is selected from the group consisting of alkyl and haloalkyl; R_1, R_2, R_3, R_4, R_5 and R_7 each are independently selected from the group consisting of hydrogen and lower alkyl; R_6 is selected from the group consisting of alkyl, haloalkyl, hydrogen, hydroxymethyl, lower alkoxy carbonyloxymethyl, N-lower alkyl carbamoyloxymethyl and N-phenylcarbamoyloxymethyl; and *n* is 0 or 1. These compounds are useful as herbicides.

3,792,063
BIS CHROMONE-2-CARBOXYLIC ACIDS
Hugh Cairns and Dennis Hunter, Loughborough, England, assignors to Fisons Limited, Suffolk, England
No Drawing. Filed May 4, 1970, Ser. No. 34,586
Claims priority, application Great Britain, May 20, 1969, 25,556/69
Int. Cl. C07d *7/34*
U.S. Cl. 260—345.2 **15 Claims**

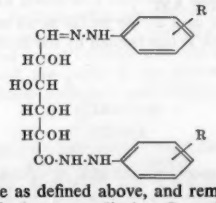
Bis chromone-2-carboxylic acids and pharmaceutically acceptable derivatives thereof in which the two chromone nuclei are linked by a group —L^1LL^2— in which L^1 is a methylene, carbonyl, carbonyloxy, —SO—, —SO_2— or —NH— group, or a sulphur or nitrogen atom, L is a linking group or bond, L^2 is an oxygen, sulphur or nitrogen atom or an —SO—, —SO_2— or an —NH— group. The compounds are indicated for use in the treatment of allergic asthma and processes for the production of the compounds are described.

3,792,064
NOVEL GLUCURONIC ACID DERIVATIVES AND PROCESS FOR THE PREPARATION THEREOF
Rokuro Kaifu, Kiyoshige Ochi, Renpei Nagashima, and Yoshikazu Hinohara, Tokyo, Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan
No Drawing. Filed Oct. 28, 1970, Ser. No. 84,912
Claims priority, application Japan, Nov. 1, 1969, 44/87,372
Int. Cl. C07d *7/00*
U.S. Cl. 260—345.7 **6 Claims**

Novel glucuronic acid derivatives of the formula



wherein R is selected from the group consisting of a lower alkyl group, halogen and a lower alkoxy group, which are useful for the prevention of hepato-cellular necrosis, are prepared by reacting a lower alkyl ester of glucuronic acid or glucurono lactone with a correspondingly substituted-phenylhydrazine to produce a substituted-phenylhydrazone of glucuronic acid substituted-phenylhydrazide of the formula



wherein R's are as defined above, and removing the substituted-phenylhydrazono radical at C_1 position.

3,792,065
PRODUCTION OF ANTHRAQUINONE-ALPHA-SULFONIC ACIDS
Heinrich Hiller, Mannheim, and Wolfgang Jentzsch, Frankenthal, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhine, Germany
No Drawing. Filed Jan. 10, 1972, Ser. No. 216,766
Claims priority, application Germany, Jan. 16, 1971, P 21 02 037.1
Int. Cl. C09b *1/00*
U.S. Cl. 260—370 **8 Claims**

Production of anthraquinone-1-sulfonic acid, anthraquinone-1,5-disulfonic acid and anthraquinone-1,8-disul-

fonic acid which are substantially devoid of mercury in which the sulfonation mixture or the strong sulfuric acid solution is treated at elevated temperature with a non-metallic reducing agent whose redox potential is from +0.1 to −0.5 volt. After working up, anthraquinone-1-sulfonic acid, anthraquinone-1,5-disulfonic acid and anthraquinone-1,8-disulfonic acid whose mercury content is 1×10^{-4}% by weight and a filtrate having a content of less than 1×10^{-4}% by weight of mercury are obtained.

3,792,066

PROCESS FOR THE PREPARATION OF ACYLATED UNSATURATED LONG-CHAIN COMPOUNDS

Edward S. Rothman, North Hills, and Gordon G. Moore, Willow Grove, Pa., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Apr. 29, 1971, Ser. No. 138,789

Int. Cl. C07c *69/66, 49/20*

U.S. Cl. 260—405 **6 Claims**

Long chain acyl groups are attached to isolated double bonds in fatty acid molecules with retention of the unsaturation by acylating a fatty acid molecule with an acylated enol such as isopropenyl stearate in the presence of an electron deficient catalyst such as aluminum chloride, boron trifluoride or stannic chloride.

3,792,067

CONTINUOUS HYDROGENATION OF FATTY MATERIALS

William A. Coombes, Pittsburgh, and Richard A. Zavada, Uniontown, Pa., John E. Hansen, Waukegan, Ill., William A. Singleton, Memphis, Tenn., and Robert R. King, Sherman, Tex., assignors to Blaw-Knox Chemical Plants, Inc., Pittsburgh, Pa.

Continuation-in-part of abandoned application Ser. No. 118,222, Feb. 24, 1971. This application June 10, 1971, Ser. No. 151,887

Int. Cl. C11c *3/12*

U.S. Cl. 260—409 **16 Claims**

Continuous hydrogenation of fatty materials by co-currently flowing an oil to be hydrogenated, having a hydrogenation catalyst dispersed therein, and hydrogen through a pipeline reactor, with the hydrogen being introduced in spaced intervals over the length of the reactor. The hydrogen is introduced in a manner to provide highly turbulent two-phase flow, preferably of the bubble type and in an amount required to provide the desired reduction in Iodine Number. The process provides a uniform and consistent product, with high linoleic acid selectivity.

3,792,068

DRY POWDER AEROSOL ANTIPERSPIRANT COMPOSITION INCORPORATING DRY POWDER ANTIPERSPIRANT ACTIVE COMPLEX AND PROCESS FOR ITS PREPARATION

Wilmer L. Luedders, Cincinnati, and Douglas L. Danneman, Forest Park, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Continuation-in-part of abandoned application Ser. No. 59,693, July 30, 1970. This application Apr. 2, 1971, Ser. No. 130,833

Int. Cl. C07f *7/00*

U.S. Cl. 260—429.3 **7 Claims**

Aluminum chlorhydroxide, zirconyl hydroxychloride and glycine, in a ratio of about 7.5:4.6:2.0 parts by weight are co-dried from an aqueous solution to a moisture of from about 0.5% to about 15% to form a powder antiperspirant active complex for incorporation into powder aerosol antiperspirant compositions.

3,792,069

OXIDATION OF MERCURY TO MERCURIC AND MERCUROUS SALTS

William C. Baird, Jr., Westfield, John H. Surridge, Scotch Plains, and Ronald L. Hartgerink, Edison, N.J., assignors to Esso Research and Engineering Company, Linden, N.J.

No Drawing. Filed Nov. 9, 1971, Ser. No. 197,104

Int. Cl. C07f *3/10*

U.S. Cl. 260—431 **9 Claims**

A process for oxidizing mercury metal to its mercurous or mercuric salts that employs the use of a nitrogen oxide species, $M_w(N_xO_y)_z$ wherein M is one selected from the group consisting of NH_4, tetra C_1–C_6 alkylammonium, tetra C_1–C_6 alkylphosphonium, hydrogen and any metal cation defined by the Periodic Table of the Elements; w ranges from 0 to 2, x is 1 or 2, y ranges from 1 to 5 and z ranges from 1 to 4, in the presence of air or oxygen.

3,792,070

BASIC ALUMINUM BROMIDE-POLYOL COMPLEXES AND METHODS OF MAKING SAME

John L. Jones, North Plainfield, and Andrew M. Rubino, New Providence, N.J., assignors to Armour Pharmaceutical Company, Chicago, Ill.

No Drawing. Continuation-in-part of abandoned application Ser. No. 88,206, Nov. 9, 1970. This application June 24, 1971, Ser. No. 156,476

Int. Cl. C07f *5/06*

U.S. Cl. 260—448 R **8 Claims**

Complexes of basic aluminum bromides containing polyhydroxy compounds (polyols) are prepared by heating an aqueous solution of basic aluminum bromide under reflux conditions, mixing the solution with a polyhydroxy compound having at least two carbon atoms which are linked to hydroxy groups, and drying the resulting mixture to a substantially friable solid, preferably by spray drying. The resulting complexes preferably contain about 5 to 20 weight percent of polyol and less than about 17 weight percent water. Such complexes have a high degree of solubility in anhydrous alcohol and an unexpectedly high compatibility with halogenated hydrocarbons. These properties make the complexes suitable for aerosol formulations and particularly antiperspirant compositions.

3,792,071

PROCESS FOR THE MANUFACTURE OF ALKOXYSILANES AND ALKOXY-POLYSILOXANES

Siegfried Nitzsche, Norbert Zeller, Werner Graf, and Ignaz Bauer, Burghausen, Germany, assignors to Wacker-Chemie G.m.b.H., Munich, Germany

No Drawing. Filed Dec. 2, 1971, Ser. No. 204,355

Claims priority, application Germany, Dec. 11, 1970, P 20 61 189.6

Int. Cl. C07f *7/18*

U.S. Cl. 260—448.8 R **7 Claims**

An improved continuous process for alkoxysilanes and alkoxypolysiloxanes is disclosed whereby alcohol reactants are introduced into a column below the introduction point of halosilane reactants or in the lowest one-third of the column, temperature is maintained above the boiling point of the alcohol, and the product is removed below the point of introduction of the alcohol.

3,792,072

SILYLATING AGENT

Richard Newton Lewis, Tecumseh, Mich., assignor to Stauffer Chemical Company, Adrian, Mich.

No Drawing. Filed Dec. 30, 1971, Ser. No. 214,407

Int. Cl. C07f *7/08*

U.S. Cl. 260—448.2 E **6 Claims**

A silylating agent is described which comprises a disilazane and an acyloxysilane, and a method for con-

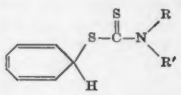
verting silanols and siloxanols to their trimethylsilyl derivatives.

3,792,073
PREPARATION OF SILOXANEOXYALKYLENE POLYMERS
Bela Prokai, Mahopac, and Bernard Kanner, West Nyack, N.Y., assignors to Union Carbide Corporation, New York, N.Y.
No Drawing. Filed May 10, 1972, Ser. No. 252,332
Int. Cl. C07f 7/18
U.S. Cl. 260—448.8 R **17 Claims**

Process for preparing siloxaneoxyalkylene block copolymers comprising reacting an amino-containing siloxane polymer with a polyoxyalkylene hydroxy compound in the presence of carbon dioxide or by reacting a carbamate-containing siloxane polymer with a polyoxyalkylene hydroxy compound.

3,792,074
2,4,6-CYCLOHEPTATRIEN-1-YL DITHIOCARBAMIC ACID ESTERS
Yoshihachi Watababe, Shiga, and Kentaro Hirai, Kyoto, Japan, assignors to Shionogi & Co., Ltd., Osaka Prf., Japan
No Drawing. Filed May 5, 1972, Ser. No. 250,822
Int. Cl. C07c 155/08
U.S. Cl. 260—455 A **9 Claims**

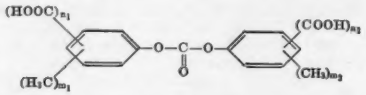
Dithiocarbamic acid derivatives represented by the general formula:



wherein R and R' are the same or different and each represents a hydrogen atom, lower alkyl group, aryl group or, taken together with the nitrogen atom, a 5- or 6-membered heterocyclic ring containing at the most one further oxygen or sulfur atom, being useful as agricultural chemicals having fungicidal action.

3,792,075
CARBONATE ESTERS OF AROMATIC HYDROXY CARBOXYLIC ACIDS
Hiroshi Kaminaka, Kobe, Norio Kotera, Amagasaki, Hiroshi Kuruma, Toyonaka, and Hideki Yanagihara, Takatsuki, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan
No Drawing. Filed Nov. 29, 1971, Ser. No. 203,036
Claims priority, application Japan, Dec. 5, 1970, 45/107,732; Dec. 17, 1970, 45/114,372
Int. Cl. C07c 65/04, 69/00
U.S. Cl. 260—463 **2 Claims**

An aromatic polycarboxylic acid of the formula,



wherein n_1 and n_2 are individually zero or an integer of up to 2, and n_1+n_2 is 2 or more, m_1 and m_2 are individually zero or an integer of up to 2, and n_1+m_1 and n_2+m_2 do individually not exceed 3, and the substituted positions of the carboxyl groups are at the 3-, 4- or 5-positions of the individual phenyl groups, provided that, when m_1 and m_2 are individually zero, n_1 and n_2 are individually an integer of up to 2 and at least one carboxyl group is substituted at the 3-, 4- or 5-position of the individual phenyl groups. These compounds are useful as a starting material for producing polymeric materials or as an intermediate for producing, for example, aromatic hydroxycarboxylic acid derivatives.

3,792,076
PROCESS FOR THE PREPARATION OF 4-AMINO-2-METHYLPYRIDINE 5-CARBOXAMIDE
Willy Leimgruber, Montclair, and Manfred Weigele, North Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.
No Drawing. Original application Aug. 7, 1970, Ser. No. 56,715. Divided and this application Feb. 4, 1972, Ser. No. 223,703
Int. Cl. C07c 121/02
U.S. Cl. 260—465.4 **5 Claims**

This invention is directed to a process for the preparation of 4-amino-2-methylpyrimidine 5-carboxamine from 2-cyano-3-di(lower alkyl)amino acrolein. The 4-amino-2-methylpyrimidine 5-carboxamide is a known compound which is a valuable intermediate in the synthesis of thiamine.

3,792,077
2,2-DIMETHYLPROPANEDIOL-1,3-DINITRITE
Rudolf Bermes, Ludwigshafen, and Karl Schmeidl, Frankenthal, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhine, Germany
No Drawing. Filed Oct. 4, 1971, Ser. No. 186,513
Claims priority, application Germany, Sept. 4, 1971, P 21 44 420.2
Int. Cl. C07c 77/02
U.S. Cl. 260—467 **1 Claim**

Nitrites of glycols and glycol derivatives obtainable by esterification with nitrous acid. The compounds are eminently suitable as diazotizing agents, particularly in organic solution.

3,792,078
CYCLODODECYLMETHYL CYCLODODECANE-CARBOXYLATES
Jack Newcombe, Freehold, Anderson O. Dotson, Jr., New Brunswick, and Jerome Robert Olechowski, Trenton, N.J., assignors to Cities Service Company, New York, N.Y.
No Drawing. Filed May 28, 1971, Ser. No. 148,142
Int. Cl. C07c 69/74
U.S. Cl. 260—468 R **1 Claim**

Cyclododecylmethyl cyclododecanecarboxylate is disclosed as a novel composition of matter which may be nitrosated with nitrosylsulfuric acid to laurinlactam. The lactam is converted by conventional methods into nylon 12.

Nylon 12 is becoming an increasingly important polymer composition for the manufacture of molded articles, fibers and the like. The present invention relates to a novel ester composition of matter which may be employed in the synthesis of laurinlactam which in turn is used in the manufacture of nylon 12. The present invention also relates to a method for manufacturing such ester compositions.

3,792,079
BENZYL CHRYSANTHEMUMATES
Vincent T. D'Orazio, Kenya, East Africa, assignor to S. C. Johnson & Son, Inc., Racine, Wis.
No Drawing. Filed July 28, 1971, Ser. No. 167,037
Int. Cl. C07c 69/74
U.S. Cl. 260—468 H **8 Claims**

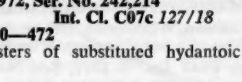
Esters of certain benzyl compounds and chrysanthemumic acid are useful as insecticides.

3,792,080
PROCESS FOR SUBSTITUTED CYCLOHEXENES AND ITS PRODUCTS
Gerhard Satzinger, Gundelfingen, and Gustav Hechtfischer, Freiburg-Landwasser, Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.
No Drawing. Filed Feb. 19, 1971, Ser. No. 117,142
Claims priority, application Germany, Feb. 17, 1970, P 20 07 215.5
Int. Cl. C07c *69/74, 69/76*
U.S. Cl. 260—471 A **1 Claim**

The present invention relates to a process for 3r-N-monomethylamino-4 cis-phenyl-4 trans-ethoxycarbonyl-cyclohexene and its N-substitution products which are generally useful as analgesics.

3,792,081
ESTERS OF HYDANTOIC ACID
Takeru Higuchi, Lawrence, Kans., and Valentino J. Stella, Forest Park, Ill., assignors to Alza Corporation
No Drawing. Continuation-in-part of abandoned application Ser. No. 197,962, Nov. 11, 1971. This application Apr. 7, 1972, Ser. No. 242,214
Int. Cl. C07c *127/18*
U.S. Cl. 260—472 **8 Claims**

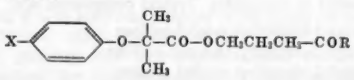
Novel esters of substituted hydantoic acids of the formula:



wherein R_1 and R_2 are hydrogen or alkyl, R_3 and R_4 are hydrogen, alkyl or phenyl, R_5 and R_6 are hydrogen or alkyl, Alk is alkylene and the pharmaceutically acceptable acid addition salts thereof. The compounds of the formula are useful as anticonvulsants and antiepileptics.

3,792,082
ESTERS OF HALOPHENOXYISOBUTYRIC ACID AND HYDROXY-ALIPHATIC ACID DERIVATIVES
Joseph Nordmann, Paris, Georges Dominique Mattioda, Enghein-les-Bains, and Gerard Paul Marie Henri Loiseau, Sceaux, France, assignors to Ugine Kuhlmann, Paris, France
No Drawing. Continuation of abandoned application Ser. No. 838,657, July 2, 1969. This application Aug. 11, 1972, Ser. No. 280,035
Claims priority, application France, July 11, 1968, 158,839; Dec. 24, 1968, 180,371, Dec. 30, 1968 181,928
Int. Cl. C07c *69/76*
U.S. Cl. 260—473 G **4 Claims**

This invention relates to medicaments having the general formula:



in which X represents a halogen atom and R represents an alkoxy or arylalkoxy group or a mono- or di-substituted amino group, the di-substitution possibly being in the form of a ring, which medicaments have hypocholesterolemiant properties; to compositions comprising such compounds and to a process for the treatment of hypocholesterolemia.

3,792,083
MIXED TEREPHTHALIC AND ISOPHTHALIC ACID SALTS OF DODECAMETHYLENE DIAMINE
Alfred Steitz, Jr., Batavia, Ill., assignor to Standard Oil Company, Chicago, Ill.
No Drawing. Filed Oct. 20, 1970, Ser. No. 82,523
Int. Cl. C07c *87/14*
U.S. Cl. 260—501.2 **1 Claim**

Novel mixed dodecamethylene diammonium salt solutions and a process for their preparation are disclosed. These solutions are prepared by reacting 1,12-diaminododecane with terephthalic acid, and isophthalic acid, hexahydroterephthalic acid or 5-tertiary-butylisophthalic acid. These mixed dodecamethylene diammonium salt solutions are useful for the preparation of polydodecamethylene tereph:halamide copolymers and fibers. These fibers, when woven into fabric, have improved aesthetic and wash-wear properties.

3,792,084
POLYQUATERNARY AMMONIUM METHYLENE PHOSPHONATES AND USES THEREOF
Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, Wilmington, Del.
No Drawing. Filed Mar. 24, 1972, Ser. No. 237,883
Int. Cl. C07f *9/38*
U.S. Cl. 260—502.5 **2 Claims**

Polyquaternary ammonium methylene phosphonates and uses thereof, particularly as scale inhibitors, chelating agents, bactericides, etc.

3,792,085
NON-CATALYTIC OXIDATION OF CYCLODODECANECARBOXALDEHYDE TO CYCLODODECANECARBOXYLIC ACID
Jack Newcombe, Freehold, N.J., assignor to Cities Service Company, New York, N.Y.
No Drawing. Filed Apr. 30, 1971, Ser. No. 139,143
Int. Cl. C07c *51/26*
U.S. Cl. 260—514 R **6 Claims**

Cyclododecanecarboxylic acid is produced by the oxidation of cyclododecanecarboxaldehyde. Unusually high yield of the acid is obtained in high purity by conducting the oxidation reaction at low temperatures in the presence of a lower carboxylic acid (e.g., acetic acid) without the aid of a catalyst.

3,792,086
PROCESS FOR THE PREPARATION OF ACRYLIC AND METHACRYLIC ACIDS
Charles E. Frank and Jawad H. Murib, Cincinnati, Ohio, assignors to National Distillers and Chemicals Corporation, New York, N.Y.
No Drawing. Continuation-in-part of abandoned application Ser. No. 99,283, Dec. 17, 1970. This application Nov. 10, 1971, Ser. No. 197,495
Int. Cl. C07c *51/32, 57/04*
U.S. Cl. 260—533 N **8 Claims**

Process for the preparation of acrylic or methacrylic acids, involving the vapor phase oxidation of propylene or isobutylene, respectively, at temperatures of up to 300° C. and in the presence of a catalyst composition containing phosphoric acid and a catalytically effective amount of palladium metal. The acrylic or methacrylic acids are selectively produced in the single step vapor phase process.

3,792,087
VAPOR PHASE OXIDATION OF ETHYLENE TO ACETIC ACID
Dorothee M. McClain, Cincinnati, Ohio, Carol A. Heller, Dillsboro, Ind., and Irving L. Mador, Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.
No Drawing. Continuation-in-part of abandoned application Ser. No. 99,282, Dec. 17, 1970. This application Nov. 10, 1971, Ser. No. 197,528
Int. Cl. C07c *51/32, 53/08*
U.S. Cl. 260—533 R **5 Claims**

A process for the selective production of acetic acid from ethylene with co-production in minor amounts of acetaldehyde, ethanol and carbon oxides, by reaction of ethylene and oxygen with added water in the feed, in the vapor phase in the presence of a catalyst composition

containing phosphoric acid and a catalytically effective amount of palladium metal.

3,792,088

SUBSTITUTED ALPHA,ALPHA-DICHLORO-METHANE-SULFENYL CHLORIDES

Wendell Gary Phillips, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed May 3, 1971, Ser. No. 139,978

Int. Cl. C07c *145/00, 147/06*

U.S. Cl. 260—543 H **6 Claims**

Alpha,alpha - dichloro - methane-sulfenyl chlorides and alpha-chloromethylbenzyl sulfides useful as herbicides and chemical intermediates for herbicides and their method of manufacture.

3,792,089

N-ARYL UREAS

Erich Klauke, Odenthal-Hahnenberg, Engelbert Kuhle, Berg. Gladbach, Helmuth Hack, Cologne-Buchheim, and Ludwig Eue, Cologne-Stammheim, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Continuation of abandoned application Ser. No. 747,486, July 25, 1968. This application Dec. 2, 1970, Ser. No. 94,534

Claims priority, application Germany, Aug. 12, 1967, F 53,224

Int. Cl. C07c *127/18*

U.S. Cl. 260—553 A **3 Claims**

N-(3-chloro - 4 - trifluoromethyl-phenyl)-N'-alkyl and -N',N'-dialkyl-urea which possess herbicidal properties and which may be produced by conventional methods.

3,792,090

p-HYDROXY-DIPHENYLAMINE COMPOUNDS

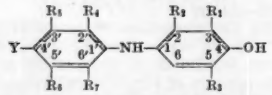
Gregoire Kalopissis, Paris, Andree Bugaut, Boulogne-sur-Seine, and Francoise Estradier, Paris, France, assignors to Societe Anonyme Dite: l'Oreal, Paris, France

No Drawing. Filed Aug. 6, 1970, Ser. No. 61,833

Int. Cl. C07c *91/42*

U.S. Cl. 260—571 **6 Claims**

Diphenylamines having the formula



wherein: Y represents a member selected from the group consisting of a hydroxy and amino, R_1 and R_3, each independently, represent a member selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, a ureido residue, and —NHCOR wherein R is lower alkyl, R_2 represents a member selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, a ureido residue, —NHCOR wherein R is lower alkyl, and —NHR_8 wherein R_8 represents a member selected from the group consisting of hydrogen, lower alkyl, lower hydroxyalkyl and carbamylmethyl, with the proviso that when R_2 is —NHR_8, R_3 is not hydrogen, R_4, R_5, R_6, and R_7 each independently represent a member selected from the group consisting of hydrogen, halogen, lower alkyl and lower alkoxy, with the proviso that when Y is hydroxy, R_2 is not hydrogen, halogen, lower alkyl or lower alkoxy, and that when Y is amino, at least two of R_1, R_2 and R_3 are other than a hydrogen and R_2 is not hydrogen when R_4, R_5, R_6 and R_7 are all hydrogen and the acid addition salts of said diphenylamines. These diphenylamines are usefully employed in cosmetic compositions for the hair including hair dye compositions and hair setting lotion compositions.

3,792,091

PREPARATION OF ANILINO IODOMETHYL-SULFONES

Aldo Joseph Crovetti, 735 E. Greenview Ave., Lake Forest, Ill. 60045, and Martin Winn, 1263 Carlisle Place, Deerfield, Ill. 60015

No Drawing. Original application July 25, 1969, Ser. No. 845,071, now Patent No. 3,663,623, dated May 16, 1972. Divided and this application Dec. 20, 1971, Ser. No. 215,953

Int. Cl. C07c *147/06*

U.S. Cl. 260—577 **4 Claims**

A method of preparing anilino iodomethylsulfones by reacting iodine monochloride with an anilino sulfonyl acetic acid at a nearly neutral pH.

3,792,092

BIS(2,3-DIMETHYLENEBUTYL)AMINES

Dale Robert Coulson, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Jan. 4, 1971, Ser. No. 103,837

Int. Cl. C07c *87/24*

U.S. Cl. 260—583 H **2 Claims**

Novel polymer-forming bis(2,3 - dimethylenebutyl) amines, e.g. N,N-bis(2,3-dimethylenebutyl)amines are prepared from allene and ammonia or certain amines in the presence of a palladium or rhodium catalyst.

3,792,093

NITRO ETHYL SULFONES

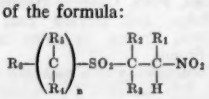
Greg A. Bullock, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Apr. 21, 1972, Ser. No. 246,495

Int. Cl. C07c *147/02, 147/06*

U.S. Cl. 260—607 A **10 Claims**

Compounds of the formula:



where

R_1 and R_2 are hydrogen or alkyl;
R_3 is alkyl or phenyl;
R_4 and R_5 are hydrogen or methyl;
R_6 is a hydrocarbon or substituted hydrocarbon; and
n is 0 or 1;

are useful as fungicides. Typical compounds are:

1-methyl-2-nitroethyl o-tolyl sulfone
1-methyl-2-nitroethyl n-butyl sulfone
1-methyl-2-nitroethyl methyl sulfone
1-phenyl-2-nitroethyl-2-naphthyl sulfone
1-phenyl-2-nitroethyl m-tolyl sulfone
1-phenyl-2-nitroethyl m-methoxyphenyl sulfone.

3,792,094

APPARATUS AND PROCESS FOR PRODUCING METHYL MERCAPTAN

Donald O. Hanson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 13, 1971, Ser. No. 188,724

Int. Cl. C07c *149/02*

U.S. Cl. 260—609 R **6 Claims**

A process for producing methyl mercaptan by reacting methanol and hydrogen sulfide to form a first stream, contacting the first stream with dimethyl sulfide for absorbing the methyl mercaptan and thereafter recovering the methyl mercaptan.

3,792,095

PROCESS FOR PRODUCING SULPHOXIDES

Tamara Petrovna Burmistrova, ulitsa Kosmonavtov 2, kv. 36, Kazan, U.S.S.R.; Tatyana Alexandrovna Bardina, Belyalvo-Bogorodskoe 38, kv. 44; Grigary Davidovich Galpern, Leninsky prospekt 13, kv. 38; and Helena Nikolaevna Karaulova, ulitsa Khersonskaya 7, kv. 393, all of Moscow, U.S.S.R.; and Nonna Alexandrovna Luchai, ulitsa Entuziastov 1, kv. 2; Nikolai Nikolaevich Terpilovsky, ulitsa Dostoevskogo 79a, kv. 20; and Adolf Alexandrovich Khitrik, ulitsa Sibirsky trakt 32, kv. 8, all of Kazan, U.S.S.R.

No Drawing. Filed Sept. 9, 1971, Ser. No. 179,208

Claims priority, application U.S.S.R., Sept. 11, 1970, 1467545

Int. Cl. C07c *147/14*

U.S. Cl. 260—607 A **4 Claims**

A process for producing sulphoxides which comprises oxidizing organic sulphides with hydrogen peroxide under foam-emulsion conditions created by blowing a gas which is inert in respect of the sulphides and hydrocarbons into the reaction mass at a rate ensuring a foaming ratio of at least 2 and at a temperature of 20–115° C., followed by isolation of the desired product. The sulphoxides thus obtained are useful as extraction and flotation reagents in hydrometallurgy and also as desiccants, defoliants, and for treating fungal diseases of animals.

3,792,096

SUBSTITUTED INDANS

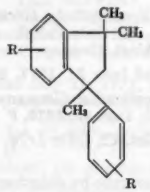
Robert M. Gemmill, Jr., Woodbury, and John W. Schick, Cherry Hill, N.J., assignors to Mobil Oil Corporation

No Drawing. Original application June 24, 1969, Ser. No. 836,161, now Patent No. 3,640,870. Divided and this application Mar. 18, 1971, Ser. No. 125,853

Int. Cl. C07c *41/00, 43/20*

U.S. Cl. 260—612 R **2 Claims**

Lubricant compositions are provided comprising a substituted indan having the structure:



in which R is at least one member of the group consisting of hydrogen, alkyl, phenyl, carboxy alkyl, carboxy phenyl, phenoxy and their thiosubstituted derivatives. The method for the preparation of these substituted indans is also provided.

3,792,097

PROCESS FOR THE PREPARATION OF DIMETHYLDECALINS

Keizo Shimada, Takeo Nishikawa, Toshiaki Harada, and Shizuo Nagahama, Tokyo, Japan, assignors to Teijin Limited, Osaka, Japan

No Drawing. Filed Oct. 25, 1972, Ser. No. 300,808

Claims priority, application Japan, Nov. 2, 1971, 46/86,783; Nov. 8, 1971, 46/88,843

Int. Cl. C07c *3/56, 5/28*

U.S. Cl. 260—666 PY **5 Claims**

In the process for the preparation of dimethyldecalins by catalytically reacting Decalin with ethylene in the presence of a Friedel-Crafts catalyst, the improvement which comprises operating the process in two steps:

(a) A catalytic alkylation reaction of cis-Decalin with ethylene at a temperature ranging between −50° and 50° C., and subsequently

(b) An isomerization reaction of the resulting product system at a temperature ranging between −20° and 80° C. in the presence of a Friedel-Crafts catalyst but absence of ethylene.

3,792,098

CONVERSION OF ALKYLAROMATICS

John T. Brandenburg, Hopewell Junction, and Robert M. Suggitt, Wappingers Falls, N.Y., and Thomas M. Liden, Los Angeles, Calif., assignors to Texaco Inc., New York, N.Y.

No Drawing. Filed May 15, 1972, Ser. No. 253,555

Int. Cl. C07c *5/24*

U.S. Cl. 260—668 A **22 Claims**

Alkylaromatic hydrocarbons are converted in the presence of a composite catalyst composed of a hydrogen mordenite, alumina and a sulfided Group VIII metal.

3,792,099

BRANCHED POLYPHENYLENES

Chen-Shen Wang, Naperville, and Arnold N. Wennerberg, Chicago, Ill., assignors to Standard Oil Company, Chicago, Ill.

Continuation-in-part of abandoned application Ser. No. 92,832, Nov. 25, 1970. This application July 31, 1972, Ser. No. 274,586

Int. Cl. C07c *15/12*

U.S. Cl. 260—668 R **22 Claims**

Polyphenylenes which have a substantial degree of branching and double bonding through the meta position are disclosed. These polyphenylenes possess increased solubility and are free from chlorine and similar impurities. They possess a high degree of thermal stability and are fusible. The polyphenylenes disclosed are useful in ablative materials and other polymer applications requiring high thermal stability.

3,792,100

PROCESS FOR THE VAPOR PHASE CATALYTIC ISOMERIZATION OF XYLENES

Takeshi Sonoda, Takeshi Hashiguchi, and Masaki Sato, Kamakura, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

No Drawing. Continuation-in-part of abandoned application Ser. No. 66,857, Aug. 25, 1970. This application June 23, 1972, Ser. No. 265,539

Claims priority, application Japan, Aug. 26, 1969, 44/66,892

Int. Cl. C07c *5/24*

U.S. Cl. 260—668 A **8 Claims**

A process for isomerizing xylenes which comprises contacting xylenes at an elevated temperature with a catalyst composition comprising a partially dealkalized mordenite-containing aluminosilicate, the aluminosilicate having a cation exchange capacity of not less than 60 m. eq./100 g., and containing, on ion exchange sites formed by aluminum atoms constituting the framework of pore structure in the aluminosilicate,

(1) 0.1 to 0.7 equivalent of alkali and alkaline earth metal ion per gram atom of the aluminum,

(2) 0.05 to 0.9 equivalent of at least one metal ion selected from the group consisting of copper, silver and chromium per gram atom of the aluminum and

(3) not more than 0.45 equivalent of hydrogen per gram atom of the aluminum.

3,792,101

PROCESS FOR PRODUCING REACTION PRODUCT OF 1,3-CONJUGATED DIENE COMPOUND AND COMPOUND HAVING TERMINAL VINYL GROUP AND CATALYST USED THEREFOR

Saburo Hattori and Kengo Tatsuoka, Tokyo, Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

No Drawing. Filed Feb. 3, 1971, Ser. No. 112,433

Claims priority, application Japan, Feb. 9, 1970, 45/11,298; Mar. 19, 1970, 45/23,363; Mar. 20, 1970, 45/23,660; May 30, 1970, 45/46,524

Int. Cl. C07c *11/00*

U.S. Cl. 260—677 R **16 Claims**

A reaction product of 1,3-conjugated diene compound and a compound having a terminal vinyl group is produced in the presence of a catalyst prepared by reacting (1) a palladium compound, (2) a compound having an anion selected from tetra- and hexafluoro-complex anion and perchlorate anion and (3) a phosphorous compound selected from a tertiary phosphine and a tertiary phosphite. When the compound having a terminal vinyl group is the same as the 1,3-conjugated diene compound, an oligomer of 1,3-conjugated diene compound is produced. On the other hand, when the two compounds are different, a co-oligomer of said two compounds is produced. When the phosphorous compound is not used or the phosphorous compound is other than phosphorous compound having at least two saturated hydrocarbon groups, an alcohol adduct of said oligomer can be produced when the reaction is in the presence of an alcohol.

3,792,102

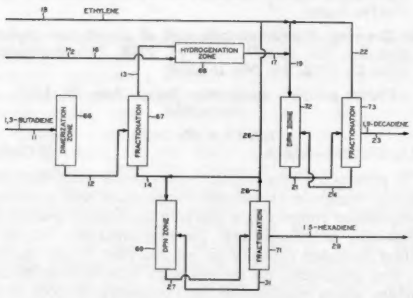
PREPARATION OF 1,9-DECADIENE FROM ETHYLENE AND CYCLOOCTENE

Van C. Vives and Robert E. Reusser, Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed Dec. 30, 1971, Ser. No. 213,928

Int. Cl. C07c *3/62, 11/12*

U.S. Cl. 260—680 R **3 Claims**



The olefin disproportionation reaction of mixtures of acyclic and cyclic olefin hydrocarbons to produce dienes is improved by using a consecutive bed catalyst arrangement wherein the first bed is a bed of magnesium oxide and the second bed is a solid olefin disproportionation catalyst. Subsequent to separation of the reaction effluent, the heavier olefin hydrocarbons produced in the consecutive bed reaction zone are returned to the reaction zone at a point intermediate to the two beds to provide conversion of the heavier materials to additional diene product. In addition, a combination process is provided wherein 1,9-decadiene and 1,5-hexadiene are produced from butadiene, ethylene, and hydrogen using dimerization, hydrogenation, and olefin disproportionation steps.

3,792,103

PROCESSES FOR THE DEHYDROGENATION OF ORGANIC FEEDSTOCKS

Darrell W. Walker, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Continuation-in-part of application Ser. No. 140,968, May 6, 1971. This application Mar. 7, 1972, Ser. No. 232,532

Int. Cl. C07c *5/18*

U.S. Cl. 260—680 E **5 Claims**

Organic compounds are dehydrogenated in the presence of molecular oxygen with a catalyst containing at least one of the elements nickel, cobalt or iron in association with tin, phosphorus, and at least one of arsenic, antimony or bismuth together with sufficient combined oxygen to satisfy the valence requirements of the components of the catalyst. Optionally, the catalytic compositions can contain minor amounts of alkali metal such as potassium. Representative of such conversions is the oxidative dehydrogenation of butane to butenes and butadiene. The conversion products are valuable compounds particularly useful as intermediates for the preparation of polymeric materials such as synthetic rubbers and the like.

3,792,104

MANUFACTURE OF ISOPRENE

Herbert Mueller, Frankenthal, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed June 21, 1971, Ser. No. 155,241

Claims priority, application Germany, June 27, 1970, P 20 31 921.5; Dec. 16, 1970, P 20 61 803.5

Int. Cl. C07c *1/24*

U.S. Cl. 260—681 **9 Claims**

Manufacture of isoprene by dehydration of 3-methyl-3-buten-1-ol with acids comprising treating the 3-methyl-3-buten-1-ol with acids, or substances which form acids in aqueous medium, in the presence of water and salts and, optionally, diluents. The said acids or acid-forming substances and salts are selected so that the anion of the acid and/or the anion of the salt are halides. The isoprene product is isolated.

3,792,105

PROCESS FOR THE PURIFICATION OF ISOPRENE

Robert H. Siegmann, Amsterdam, Netherlands, assignor to Shell Oil Company, New York, N.Y.

Filed Oct. 11, 1972, Ser. No. 296,712

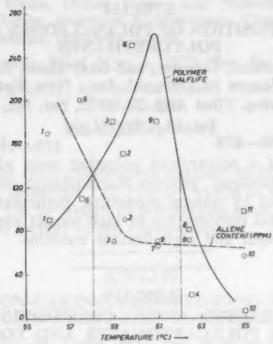
Claims priority, application Netherlands, Oct. 29, 1971, 7114983

Int. Cl. C07c *7/00*

U.S. Cl. 260—681.5 R **10 Claims**

A process for the removal of allenes and other compounds hindering the polymerization of isoprene from an

isoprene-containing C_5 hydrocarbon fraction comprises contacting said fraction with finely dispersed metallic sodium at a temperature in the range between 58 and 62° C.



3,792,106
CONVERSION OF OLEFINS
Robert B. Regier, Bartlesville, Okla., assignor to Phillips Petroleum Company
No Drawing. Filed Oct. 4, 1971, Ser. No. 186,432
Int. Cl. C07c *3/62*
U.S. Cl. 260—683 D **8 Claims**

A composition comprising tungsten oxide, zinc oxide and silica is a catalyst for converting olefins according to the olefin reaction.

3,792,107
PROCESS FOR DISPROPORTIONATING THE OLEFINS
Vittorio Fattore, S. Donato Milanese, Marcello Mazzei, Milan, and Bruno Notari, S. Donato Milanese, Italy, assignors to Snam Progetti, S.p.A., S. Donato Milanese, Italy
No Drawing. Filed July 21, 1971, Ser. No. 164,916
Claims priority, application Italy, July 29, 1970, 28,016/70
Int. Cl. C07c *3/62*
U.S. Cl. 260—683 D **11 Claims**

A process is disclosed for disproportionating an olefin having from 3 to 30 carbon atoms, wherein the olefin is contacted with a catalyst consisting essentially of an oxide of tungsten and copper or of tungsten and a metal of the 8th group of the periodic system, preferably iron, cobalt or nickel, in which the ratio of metal to tungsten is in the range of 1:3 to 5:1. The catalyst is advantageously supported by a carrier such as silica and its contact with the olefin is effected at a temperature in the range of 400 to 700° C., at a pressure in the range of 1 to 50 atmospheres and for a contact time in the range of 0.1 to 60 seconds.

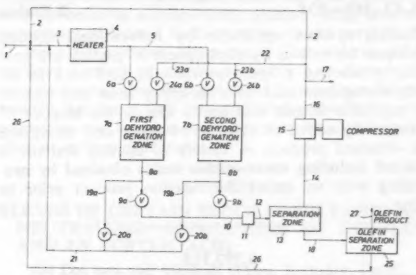
3,792,108
DISMUTATION OF OLEFINS
Robert P. Arganbright, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.
No Drawing. Original application July 23, 1969, Ser. No. 844,207, now Patent No. 3,702,827. Divided and this application Oct. 12, 1971, Ser. No. 188,501
Int. Cl. C07c *3/62*
U.S. Cl. 260—683 D **16 Claims**

Using as a catalyst MoO_3-Re_2O_7 (weight ratio approximately 10:1) on an alumina support it is possible to carry out dismutation reactions of C_2–C_{20} acyclic monoolefins at low temperatures and much smaller amounts of Re_2O_7 than are conventionally necessary, e.g., prior art required 10 percent MoO_3 at 150° C. or 20 percent Re_2O_7 at 38°; whereas the present invention requires 10 percent MoO_3-1 percent Re_2O_7 at 38° C. to give higher conversion and yields. By modifying this catalyst with a small amount of fluoride ion isobutylene which otherwise is subject to oligomerization can be dismutated with C_3–C_{20} acyclic monoolefins. The products are different and more desirable olefins than the starting materials.

3,792,109
ISOMERIZATION OF 1-OLEFINS OR TRANS-OLEFINS TO INTERNAL CIS-OLEFINS
William J. Trepka and John A. Favre, Bartlesville, Okla., assignors to Phillips Petroleum Company
No Drawing. Filed Sept. 11, 1972, Ser. No. 287,738
Int. Cl. C07c *5/24*
U.S. Cl. 260—683.2 **11 Claims**

The isomerization of 1-olefins or trans-olefins to internal cis-olefins is accomplished by means of a catalyst system comprising an organolithium compound with a potassium salt of a fatty acid or of an alcohol. For example, 1-butene yields cis-2-butene.

3,792,110
DEHYDROGENATION PROCESS FOR CONVERTING n-PARAFFIN HYDROCARBON INTO n-OLEFIN HYDROCARBON
Charles A. Senn III, Greenville, S.C., and Levi C. Parker, Port Arthur, Tex., assignors to Texaco Inc., New York, N.Y.
Filed Dec. 29, 1971, Ser. No. 213,558
Int. Cl. C07c *3/28*
U.S. Cl. 260—683.3 **4 Claims**



A dehydrogenation process wherein n-paraffin hydrocarbon at an elevated temperature, in the presence of molecular hydrogen is contacted with a dehydrogenation catalyst comprising a dehydrogenation component supported upon an inorganic metal oxide base to convert said n-paraffin hydrocarbon into n-olefin hydrocarbon. Such process incorporates an improvement for increasing the selectivity of said catalyst for converting n-paraffin hydrocarbon into n-olefin hydrocarbon, which improvement comprises treating a fresh or freshly regenerated dehydrogenation catalyst, prior to use in the dehydrogenation reaction, with paraffin hydrocarbon and hydrogen in a mole ratio of hydrogen to hydrocarbon of from about 0.5:1 to about 40:1, at a temperature of from about 750° F. to about 1000° F., and a pressure of from about atmospheric to about 50 p.s.i.g. for a period of from about 12 to about 24 hours.

3,792,111

TRANSFER MEDIUM FOR PRODUCING SCRATCH AND SMUDGE RESISTANT MARKS

Charles T. Fellows, Kettering, Stanley R. Hermann, Xenia, and Norman C. Hochwalt, Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

No Drawing. Application Oct. 29, 1970, Ser. No. 85,312, now Patent 3,689,316, dated Sept. 5, 1972, which is a continuation-in-part of abandoned application Ser. No. 54,856, July 14, 1970. Divided and this application Feb. 1, 1972, Ser. No. 222,707

Int. Cl. C08g *37/32, 47/10, 51/28*

U.S. Cl. 260—33.6 SB **12 Claims**

A transfer medium comprising a base having a transferable coating composition thereon. The transferable composition comprises about 3 to 40 percent by weight of polysiloxane rubber gum; about 3 to 40 percent by weight of a polysiloxane resin; about 15 to 70 percent by weight of a thermoplastic aminotriazine-sulfonamide-aldehyde resin; and about 1 to 45 percent by weight of a sensible material. The outer surface of the coating composition has a thin coating of wax.

3,792,112

EPOXIDE-DIMETHYLOL PROPIONIC ACID REACTION PRODUCT WITH AMINE ALDEHYDE CONDENSATE

John Allister Gannon and Arthur Allen Tracton, Toms River, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 789,948, Jan. 8, 1969, and a division of application Ser. No. 90,014, Nov. 16, 1970, now Patent No. 3,707,526. This application Oct. 16, 1972, Ser. No. 298,170

Int. Cl. C08g *45/10*

U.S. Cl. 260—834 **2 Claims**

Coating systems applicable by conventional coating techniques as well as by electrophoretic coating are provided by reacting a hydroxycarboxylic acid such as dimethylolpropionic acid with an epoxy resin and optionally any of a dibasic acid and a diol in the absence of an externally added esterification catalyst and curing the thus obtained product. A variety of coating systems is obtained including water-soluble resins obtained by neutralizing with an amine the reaction product prior to curing.

3,792,113

THERMOPLASTIC POLYMERS CONTAINING POST CHLORINATED VINYL HALIDE-BIS(HYDROCARBYL) VINYL PHOSPHONATE COPOLYMERS

Jagadish C. Goswami, New York, and Jung Il Jin, Irvington, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

No Drawing. Original application Dec. 23, 1970, Ser. No. 101,194, now Patent No. 3,725,359. Divided and this application Sept. 21, 1972, Ser. No. 290,940

Int. Cl. C08f *27/03;* **C08g** *41/04*

U.S. Cl. 260—857 UN **13 Claims**

There are disclosed post-chlorinated copolymers of: (1) one or more vinyl halides; (2) one or more bis(hydrocarbyl) vinylphosphonates; and (3) as an optional component one or more ethylenically unsaturated monomers. These post-chlorinated products have a higher glass transition temperature than the copolymers from which they are derived and are, therefore, of greater utility in many applications such, for example, as in the preparation of polyblends with burning thermoplastics wherein they impart a significant degree of flame retardance without causing substantial reduction in the heat distortion temperature of the resulting polyblends.

3,792,114

COMPOSITION OF POLYSULFONES AND POLYURETHANES

Robert Lauchlan, Granger, and Gray Shaw, South Bend, Ind., assignors to Uniroyal, Inc., New York, N.Y.

No Drawing. Filed Aug. 31, 1972, Ser. No. 285,275

Int. Cl. C08g *41/04*

U.S. Cl. 260—858 **159 Claims**

Blends of a polyarylene polyether resin with a polyurethane elastomer provide thermoplastic compositions characterized by unique properties, particularly, an unusually useful combination of high impact strength, high tensile strength and high flexural modulus.

3,792,115

THERMOPLASTIC RESIN COMPOSITION COMPRISING POLYCARBONATES AND POLYARYLENE ESTERS

Hiroshi Kishikawa, Toyonaka, Kiyoshi Yasuno, Ibaragi, Shuji Kitamura, Toyonaka, Katsuji Ueno, Hirakata, and Haruo Inoue and Nobuhiro Toyota, Takatsuki, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka-fu, Japan

No Drawing. Filed Mar. 8, 1972, Ser. No. 232,919

Claims priority, application Japan, Mar. 8, 1971, 46/12,656

Int. Cl. C08g *39/10*

U.S. Cl. 260—860 **4 Claims**

A thermoplastic resin composition of polycarbonate improved in impact strength and heat deformation resistance which comprises 1 to 99% by weight of polycarbonate resin and 99 to 1% by weight of polyarylene ester on the basis of the total weight of the composition.

3,792,116

FLAME-RESISTANT POLYMERIC COMPOSITIONS CONTAINING BROMINATED ADDUCTS OF ACYCLIC TRIENES

Carlos G. Cardenas, Jacksonville, Fla., and Donnie G. Brady, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Original application Jan. 2, 1970, Ser. No. 416, now Patent No. 3,697,607. Divided and this application Apr. 19, 1972, Ser. No. 245,381

Int. Cl. C09k *3/28*

U.S. Cl. 260—861 **14 Claims**

Flame-resistant polymeric compositions containing novel brominated adducts of acyclic trienes with halocloperitadienes and with substituted halocyclopentadienes are disclosed. Methods of preparing said novel compounds are also disclosed.

3,792,117

FLAME RESISTANT POLYESTER

William Kolodchin, Warren, and David R. Brackenridge, Royal Oak, Mich., assignors to Ethyl Corporation, Richmond, Va.

No Drawing. Filed Sept. 15, 1971, Ser. No. 180,871

Int. Cl. C08f *1/00*

U.S. Cl. 260—864 **4 Claims**

The flame resistance of polyesters can be enhanced with a phosphazene, i.e., a condensation product of a phosphonitrilic dihalide and 2,3-dibromopropanol. Saturated and unsaturated resins can be used as can thermoplastic and thermosetting materials, linear and cross-linked polymers, and fibers and films.

3,792,118

RESIN COMPOSITION COMPRISING STYRENE RESIN AND A POLYARYLENE ESTER

Hiroshi Kishikawa, Kiyoshi Yasuno, Shuji Kitamura, Katsuji Ueno, Haruo Inoue, and Nobuhiro Toyota, Osaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka-fu, Japan

No Drawing. Filed Mar. 8, 1972, Ser. No. 232,901

Claims priority, application Japan, Mar. 8, 1971, 46/12,657

Int. Cl. C08g *39/10*

U.S. Cl. 260—873 3 Claims

A styrene resin composition resistant to heat deformation which comprises 1 to 95% by weight of styrene resin and 99 to 5% by weight of polyarylene ester on the basis of the total weight of the composition.

3,792,119

SOLID, NON-CAKING, FREE-FLOWING STYRENE/MALEIC ANHYDRIDE COMPOSITIONS

Dale R. Dill, St. Louis, Mo., and William O. Springer, Belleville, Ill., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Sept. 22, 1969, Ser. No. 860,019

Int. Cl. C08f *29/34*

U.S. Cl. 260—874 9 Claims

Solid, non-caking, free-flowing compositions comprising particulate styrene/maleic anhydride polymers subject to caking during storage having dispersed therein an anti-caking amount of a natural or synthetic polymer anti-caking agent which is soluble in water or aqueous alkali and which does not have any substantial tendency to cake during storage.

3,792,120

STABILIZED POLYPHENYLENE ETHER COMPOSITIONS

Robert M. Summers, Arlington, Mass., and Klaus E. Holoch, Roxheim/Pfalz, Germany, assignors to General Electric Company

No Drawing. Filed Oct. 12, 1971, Ser. No. 188,428

Int. Cl. C08g *51/60, 43/00, 43/02*

U.S. Cl. 260—874 17 Claims

There are provided stabilized compositions consisting of a major proportion of a thermoplastic resin having a polyphenylene ether component and a minor proportion of a stabilizer consisting of an N,N,N′,N″-tetrasubstituted arylphosphonic diamide, alone, or optionally combined with a boron compound.

3,792,121

STABILIZED POLYPHENYLENE ETHER COMPOSITIONS

Visvaldis Abolins, Delmar, and Peter F. Erhardt, Webster, N.Y., and Klaus E. Holoch, Roxheim, Pfalz, Germany, assignors to General Electric Company

No Drawing. Filed Oct. 14, 1971, Ser. No. 189,192

Int. Cl. C08g *23/18, 51/56, 51/60*

U.S. Cl. 260—874 23 Claims

There are provided stabilized compositions consisting of a major proportion of a thermoplastic resin having a polyphenylene ether component and a minor proportion of a stabilizer consisting of (i) an organic chelating agent, (ii) a mixture of (i) with a hexaalkylphosphoric triamide, or (iii) a mixture of (i) or (ii) with a boron compound, a hydrazine compound or a mixture of such compounds.

3,792,122

POLYPHENYLENE ETHER RESINS CONTAINING A BUTADIENE-ACRYLIC-STYRENE POLYMER MODIFIER

Harry C. Fromuth, Jr., Trevose, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

No Drawing. Continuation-in-part of application Ser. No. 859,191, Sept. 18, 1969. This application Apr. 21, 1971, Ser. No. 136,196

Int. Cl. C08f *41/12*

U.S. Cl. 260—876 R 5 Claims

Polyphenylene ether resins are modified by a mulitple-stage sequentially-produced polymer comprising a first stage polymerized from a monomer mixture comprising at least 40 weight percent butadiene and a final stage polymerized in the presence of a product containing the first stage from a monomer mixture comprising a member selected from the group consisting of alkyl methacrylates, alicyclic methacrylates, alkyl acrylates and mixtures of the foregoing.

3,792,123

THERMOPLASTIC COMPOSITION COMPRISING A POLYPHENYLENE ETHER AND A NORMALLY RIGID RESINOUS PRODUCT OF AN ACRYLIC MONOMER AND DIENE RUBBER

Visvaldis Abolins, Delmar, and Donald L. Reinhard, Albany, N.Y., assignors to General Electric Company

No Drawing. Continuation-in-part of application Ser. No. 873,663, Jan. 3, 1969. This application Aug. 23, 1972, Ser. No. 283,094

Int. Cl. C08f *15/00, 19/00*

U.S. Cl. 260—876 R 24 Claims

This invention relates to a polyphenylene ether composition having improved impact resistance. The composition comprises a polyphenylene ether and a normally rigid resinous product of an acrylic monomer and a diene rubber, the resinous acrylic-rubber product being present in an amount of from 1 to 25 parts by weight per 100 parts of the total resinous components. The addition of the resinous product of acrylic monomer and diene rubber provides unexpected improvements in toughness of parts molded therefrom, and in a preferred embodiment, these properties are improved without substantially impairing gloss or surface appearance.

3,792,124

BLENDS OF CERTAIN BLOCK COPOLYMERS AND NEUTRALIZED COPOLYMERS OF ETHYLENE AND AN ACRYLIC ACID

Sol Davison and Michael Wales, Berkeley, Calif., assignors to Shell Oil Company

No Drawing. Filed Feb. 24, 1972, Ser. No. 229,176

Int. Cl. C08f *27/04, 29/34*

U.S. Cl. 260—876 B 5 Claims

Clear polymeric blends with improved adhesion are obtained from a combination of selectively hydrogenated block copolymers and ionomers comprising neutralized copolymers of ethylene and α-β unsaturated acids.

3,792,125

TRANSPARENT HEAT RESISTANT GUM PLASTIC

John M. Wefer, Wayne, N.J., assignor to Uniroyal, Inc., New York, N.Y.

No Drawing. Filed Dec. 2, 1971, Ser. No. 204,368

Int. Cl. C08f *15/40*

U.S. Cl. 260—876 R 4 Claims

Transparent, heat resistant thermoplastic compositions are prepared from terpolymers of t-butylstyrene, acrylon-

itrile and methylmethacrylate blended with grafts of the terpolymers onto polybutadiene rubber or a rubbery styrene-butadiene copolymer.

Transparency as well as good thermal and mechanical properties can be achieved in the gum plastic blends with a wide variety of monomer ratios in the resinous terpolymers.

3,792,126

PROCESS FOR POLYMERIZING VINYL AROMATIC MONOMERS USING NEW RADICAL-TYPE CATALYSTS

Lino Vio, Mazeres-Lezons par Gelos, France, assignor to Societe Anonyme dite: Societe Nationale des Petroles d'Aquitaine, Courbevoie, France

No Drawing. Filed June 21, 1971, Ser. No. 155,214
Claims priority, application France, June 26, 1970, 7023800
Int. Cl. C08f *7/04, 7/06, 1/74*
U.S. Cl. 260—880 R **15 Claims**

The present invention concerns a process for polymerizing monomers and particularly styrene by using new catalysts.

The invention is characterized by the fact that organic silicon derivatives, with a higher temperature stability than the catalysts normally used, are used as catalysts.

The use of these new organic silicon derivatives as catalysts particularly in polymerizing styrene ensures a significant reduction in the residual monomer content of the polystyrene product, and thus allows such a product to be used in contact with foodstuffs.

3,792,127

HYDROGENATED BLOCK COPOLYMERS AND PROCESS FOR PREPARING SAME

George A. Gillies, Berkeley, Calif., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Filed Sept. 22, 1971, Ser. No. 182,867
Int. Cl. C08f *19/08, 27/24*
U.S. Cl. 260—880 B **8 Claims**

Block polymers having substantially improved processability comprise polymers having at least two polymer blocks A, at least one polymer block B and at least one polymer block C, blocks A being independently selected polymer blocks of at least one monoalkenyl arene, block B is a polymer block of at least one conjugated diene and block C comprises a random copolymer block of a conjugated diene and a monoalkenyl arene. Blocks A comprise at least 25% by weight of the total arene units of the block copolymer, block B comprises at least 25% by weight of the total diene units, and block C contains between 4 and 75% by weight of the total diene units and between 4 and 75% of the total arene units. Hydrogenated derivatives of these block copolymers also are contemplated.

3,792,128

FLUOROPOLYMER-CARBOXYLATED STYRENE-BUTADIENE FUNCTIONAL SURFACE COATING COMPOSITIONS

Melville W. Uffner, Media, and Dewey G. Holland, Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

No Drawing. Original application Dec. 15, 1969, Ser. No. 885,290, now abandoned. Divided and this application Dec. 1, 1971, Ser. No. 203,901
Int. Cl. C08d *9/08*
U.S. Cl. 260—890 **15 Claims**

Functional surface coating compositions, prepared by blending a mixture of a fluorine containing polymer and a non-fluorine containing material in aqueous medium, impart solvent, grease and oil resistance to cellulosic materials.

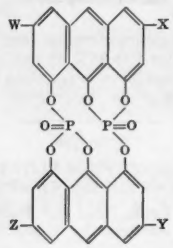
3,792,129

BIS-(PHOSPHORYLATED ANTHRALIN) COMPOUNDS AND PROCESS FOR PREPARING SAME

Charles Aubrey Friedmann, Florence, Italy, Peter Hofer, Liestal, Switzerland, and Winthrop E. Lange, Greenwich, Conn., assignors to Mundipharma AG., Rheinfelden, Switzerland

No Drawing. Filed Sept. 8, 1971, Ser. No. 178,829
Int. Cl. C07d *103/04;* **A01n** *9/36*
U.S. Cl. 260—927 R **14 Claims**

Phosphorylated bis-anthracenetriol compounds of the structure:



wherein W, X, Y and Z are selected from the group consisting of hydrogen, lower alkyl, halo-alkyl, acetoxi-alkyl, carboxyl, carboalkyloxi, alkyloxialkyl, halogen and nitro wherein said alkyl is from 1 to 3 carbon atoms in chain length, are prepared by phosphorylating appropriate 1,8,9-trihydroxi-anthracene or 3-substituted-1,8,9 - trihydroxi-anthracene compounds in the presence of an aromatic or aliphatic tertiary amine base, preferably pyridine. The resultant compounds are useful in the treatment of psoriasis, seborrhea, eczema, inflammation and arthritis. Pharmaceutical compositions such as ointments, lotions, shampoos and detergent cakes, beside oral and rectal application forms, containing the aforesaid compounds are described together with methods for their preparation and their use in therapy.

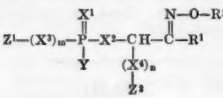
3,792,130

ALKOXYIMINO-PHOSPHORUS COMPOUNDS

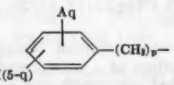
Leonard J. Stach, Riverside, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

No Drawing. Filed Nov. 29, 1971, Ser. No. 203,006
Int. Cl. C07f *9/08, 9/16;* **A01n** *9/36*
U.S. Cl. 260—944 **6 Claims**

This invention discloses new compounds of the formula

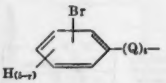


wherein R^1 is selected from the group consisting of alkyl, phenyl, halophenyl, alkylphenyl and alkyl-halophenyl; R^2 is alkyl; X^1, X^2, X^3 and X^4 are independently selected from the group consisting of oxygen and sulfur; *m* and *n* are each integers from 0 to 1; Z^1 is selected from the group consisting of alkyl, alkenyl and



wherein A is selected from the group consisting of alkyl, alkenyl, alkoxy, alkylthio, halogen, nitro, alkylsulfoxide, alkylsulfone and dialkylamino; *q* is an integer from 0 to 5, and *p* is an integer from 0 to 3; Z^2 is selected from the

group consisting of hydrogen and Z^1, provided that when Z^2 is hydrogen then n is zero; and Y is selected from the group consisting of alkyl, alkenyl, alkoxy, alkylthio, amino, alkylamino, dialkylamino and



wherein B is selected from the group consisting of alkyl, alkenyl, alkoxy, alkylthio, halogen, nitro, alkylsulfoxide, alkylsulfone and dialkylamino; r is an integer from 0 to 5; Q is selected from the group consisting of oxygen, sulfur, alkylene, alkyleneoxy and alkylenethio, and t is an integer from 0 to 1.

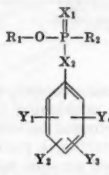
Also disclosed are insecticidal and acaricidal compositions comprising an inert carrier and an above described compound.

3,792,131
O-METHYL-O-(4-BROMO-2,5-DICHLOROPHENYL) PHENYLPHOSPHONATE
Sidney B. Richter, Chicago, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.
No Drawing. Filed Aug. 3, 1970, Ser. No. 60,716
Int. Cl. A01n *9/36;* **C07f** *9/40*
U.S. Cl. 260—961 **1 Claim**

The subject matter of this application is O-alkyl O-(4-bromo-2,5-dichlorophenyl) phenylphosphonates useful as insecticides and miticides.

3,792,132
PROCESS FOR PREPARING ALKYL PHENYL PHOSPHATE AND PHOSPHOROTHIONATE COMPOUNDS
Donald Norman Bernhart, Mount Pleasant, Tenn., assignor to Stauffer Chemical Company, New York, N.Y.
No Drawing. Filed Dec. 21, 1970, Ser. No. 100,554
Int. Cl. C07f *9/18, 9/12*
U.S. Cl. 260—973 **16 Claims**

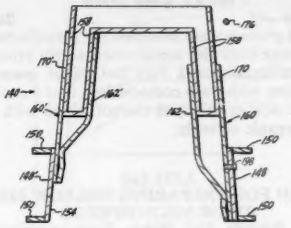
A process for producing phosphorus acid esters of the formula:



by the reaction of a phenolic compound with a phosphonochloridate, phosphorochloridate, phosphonochlorothioate or phosphorochlorothioate compounds in a reaction matrix consisting essentially of an oxygenated solvent, an amine and a basic metal compound. The reaction matrix can contain substantial quantities of water.

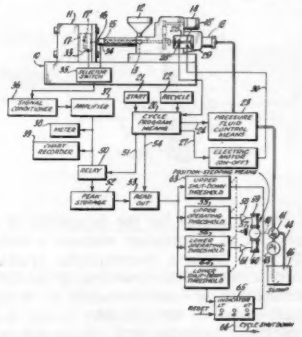
3,792,133
METHOD FOR SLIP-FORMING WALLS OF ASYMMETRICAL TRANSVERSE CROSS SECTION
Roy Robert Goughnour, Mason, Mich., assignor to A. C. Aukerman Co., Jackson, Mich.
Filed June 30, 1972, Ser. No. 268,159
Int. Cl. E04b *1/16*
U.S. Cl. 264—33 **3 Claims**

The invention pertains to a method for forming elongated concrete structures, such as walls and the like, by slip forming. In particular, the invention is directed to the concept of slip-forming walls of asymmetrical transverse cross section as required in the forming of highway barrier walls. The concrete slip form includes opposite sidewalls and open front and rear ends. At least one of the sidewalls is vertically adjustable wherein the sidewall configuration being formed thereby may have a height variance with respect to the opposite sidewall being formed. The form includes fixed wall portions associating



with the adjustable wall portion and power means permit adjustment of the vertical adjustable wall. It is also within the scope of the invention to provide a form wherein both sidewalls are vertically adjustable, and the form includes means for introducing steel reinforcement into the formed wall, and periodically permitting accessory equipment to be embedded into the wall.

3,792,134
METHOD FOR MONITORING PRODUCT QUALITY IN A PLASTICS INJECTION-MOLDING MACHINE
Donald C. Paulson, Southington, Conn., assignor to Litton Industrial Products, Inc.
Original application July 15, 1969, Ser. No. 841,719, now Patent No. 3,628,901, dated Dec. 21, 1971. Divided and this application Oct. 15, 1970, Ser. No. 81,042
Int. Cl. B29f *1/00*
U.S. Cl. 264—40 **2 Claims**



The invention contemplates control of quality and consistency in products of recycled operation of a plastics injection-molding machine by observing, for each cycle of operation, the peak pressure of plasticized melt and by comparing the observed value against a reference value. The polarity and magnitude of difference between observed and reference values are utilized to effect corrective adjustment on the feed force operative on plasticized melt on a succeeding cycle of the machine. If desired, means responsive to detected inability to effect adequate correction may automatically shut down the machine and indicate the polarity of the failure.

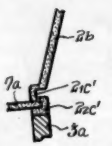
3,792,135
PROCESS FOR MANUFACTURING CELLULOSIC REVERSE OSMOSIS MEMBRANES USING A VERY HIGH TEMPERATURE INITIAL AQUEOUS QUENCH
Barry M. Brown and Elbert L. Ray, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Jan. 6, 1972, Ser. No. 215,809
Int. Cl. B29d *27/00*
U.S. Cl. 264—41 28 Claims

Improved processes are disclosed for manufacturing cellulosic "reverse osmosis" membranes, which processes involve the utilization of a very hot initial quench bath, in combination with dope compositions that contain acetic acid, formic acid or mixtures thereof, either with or without other organic solvents.

3,792,136
METHOD FOR PREPARING HOLLOW METAL OXIDE MICROSPHERE
Charles R. Schmitt, Oak Ridge, Tenn., assignor to the United States of America as represented by the United States Atomic Energy Commission
No Drawing. Filed Nov. 2, 1971, Ser. No. 195,052
Int. Cl. B29d *27/08*
U.S. Cl. 264—44 8 Claims

Hollow refractory metal oxide microspheres are prepared by impregnating resinous microspheres with a metallic compound, drying the impregnated microspheres, heating the microspheres slowly to carbonize the resin, and igniting the microspheres to remove the carbon and to produce the metal oxide.

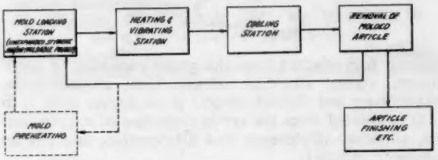
3,792,137
PROCESS AND APPARATUS FOR FORMING THE BOTTOM STRUCTURE OF A FOAMED THERMOPLASTIC SYNTHETIC RESIN-MADE CONTAINER
Jingo Seto, 6 29-ban 3, 3-chome, Akatsuka Shin-machi, Tokyo, Japan
Filed Feb. 1, 1971, Ser. No. 111,228
Claims priority, application Japan, Feb. 12, 1970, 45/12,368
Int. Cl. B29d *27/00;* B29f *5/02*
U.S. Cl. 264—45 3 Claims



Process and apparatus for the formation of a secure bottom structure of a container wherein a wall-forming piece made from foamed thermoplastic synthetic resin material and a mating bottom-forming material made from thermoplastic or non-thermoplastic material are securely melt joined or mechanically joined together to form the container, with aid of a caulking force exerted on the to-be-joined portions of the wall-forming piece and bottom-forming material in the joining operation.

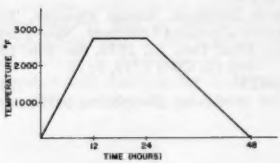
3,792,138
PROCESS OF MOULDING FOAMABLE MATERIALS BY SIMULTANEOUSLY HEATING AND VIBRATING THE MOLD
Sidney G. Lammers, Liverpool, N.Y., assignor to Dart Industries, Inc., Los Angeles, Calif.
Filed July 15, 1969, Ser. No. 841,873
Int. Cl. B29d *27/100*
U.S. Cl. 264—46 8 Claims

A process for the formation of expandable thermoplastic synthetic resins employs vibration to assure a uniform article construction. The particular article mold cavity is loaded with unexpanded resin beads and is simultaneously vibrated and heated until the beads have been



fully expanded. The process further enables a user to create laminations within a molded article by using expandable beads of different densities or other similar moldable materials.

3,792,139
PROCESS FOR FLATTENING ALUMINA SUBSTRATES
Robert N. Weinstein, Granada Hills, Calif., assignor to the United States of America as represented by the Secretary of the Army
Filed Aug. 9, 1972, Ser. No. 279,142
Int. Cl. C04b *41/02*
U.S. Cl. 264—58 1 Claim

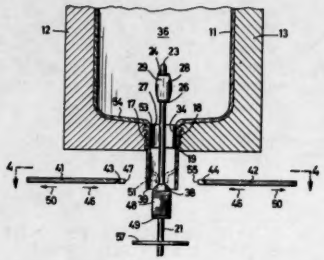


A process for flattening ceramic substrates is disclosed. The process includes positioning the ceramic substrates to be flattened or contoured between high purity ground alumina plates and exerting a predetermined amount of force on the positioned ceramic substrate during an annealing cycle. The annealing cycle includes slowly heating the ceramic substrate from ambient temperature over a time interval of about 12 hours to attain a temperature of about 2580° F., maintaining the ceramic substrate at the specified temperature for about 12 hours until straightening occurs, and thereafer, slowly cooling the ceramic substrate to ambient temperature.

3,792,140
METHOD FOR MOULDING THE WALL OF THE NECK OF AN EXTRUDED HOLLOW BODY
Wolfram Schiemann, Engen-Nagele-Strasse 17, 714 Ludwigsburg, Germany
Filed Dec. 8, 1971, Ser. No. 206,042
Int. Cl. B29c *17/07;* B29d *3/02*
U.S. Cl. 264—98 2 Claims

An upwards moving mandrel passes through an outlet hole in the bottom of a pair of blow moulding dies. The mandrel carries two externally inflatable and deflatable bubbles. The first bubble carries a metal reinforcing ring which is positioned in the neck during blow moulding and

retained there. The second bubble tears open the end of the extruded tube after it has been turned inward into the



hollow body and presses it to adhere against the inner wall of the body.

3,792,141

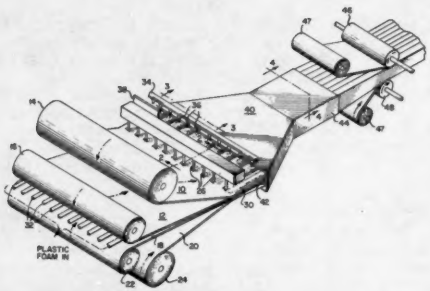
METHOD OF STRUCTURAL FABRICATION

Worthington W. Offutt, Cathedral City, Calif. (522 N. Calle Marcus, Palm Springs, Calif. 92262)

Continuation-in-part of abandoned application Ser. No. 47,834, June 19, 1970. This application May 26, 1972, Ser. No. 257,394

Int. Cl. B29d *27/00;* **B32b** *7/08, 31/12*

U.S. Cl. 264—47 **18 Claims**



A structural product formed by passing a foam-filled, resin-impregnated fiberglass laminate into a preformed mold or extrusion to shape and cure the material into an insulated, pre-fabricated, lightweight, cellular structure.

3,792,142

UTILIZING MIXTURES OF YTTRIA, MAGNESIA, AND LANTHANUM OXIDE IN MANUFACTURE OF TRANSPARENT ALUMINA

Kazuo Kobayashi, Nagoya, and Masayuki Kaneno, Tokoname, Japan, assignors to NGK Insulators, Ltd., Mizuho-ku, Nagoya, Japan

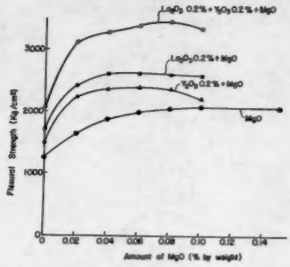
Filed Aug. 18, 1970, Ser. No. 64,694

Claims priority, application Japan, Aug. 27, 1969, 44/67,338

Int. Cl. C04b *35/10, 35/64*

U.S. Cl. 264—65 **6 Claims**

A method of manufacturing a polycrystalline translucent alumina consisting of a high purity alumina and having excellent optical transmission property for the light in the visible spectrum, thermal shock resistance and mechanical strength which comprises the following steps, calcining alumina powders having a purity of more than 99.0% by weight as a starting material at a temperature of 1,050–1,250° C. in air, adding to said alumina powders 0.05–0.5% by weight of Y_2O_3, 0.05–0.5% by weight of La_2O_3 and 0.01–0.1% by weight of MgO, mixing and then molding said alumina powders added with said additives, sintering at first said molded mixture at a temperature of 1,200-1,450° C. and secondly sintering in vacuum or a reducing atmosphere such as hydrogen or dissociated ammonia gas at a temperature of 1,600–1,800° C.



3,792,143

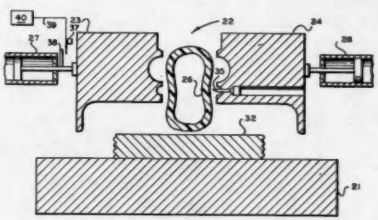
METHOD FOR BLOW MOLDING A HOLLOW ARTICLE HAVING AN ATTACHED HOLLOW ADJUNCT

Tony E. Branscum, Winfield, Kans., and Bill T. Morgan and Donald L. Peters, Bartlesville, Okla., assignors to Phillips Petroleum Company

Continuation of abandoned application Ser. No. 57,010, June 9, 1970, which is a division of application Ser. No. 643,572, June 5, 1967, now Patent No. 3,585,681. This application Apr. 24, 1972, Ser. No. 247,111

Int. Cl. B29c *17/07*

U.S. Cl. 264—94 **4 Claims**



A hollow object having an integral hollow adjunct portion is formed by blow molding. Two mold parts pinch off a portion of the parison to form the adjunct, and the remainder of the parison forms the main body of the blown object.

3,792,144

PACKAGING PROCESS

Francis L. Burkett and Richard J. Lee, Breckenridge, Mich., assignors to The Dow Chemical Company, Midland, Mich.

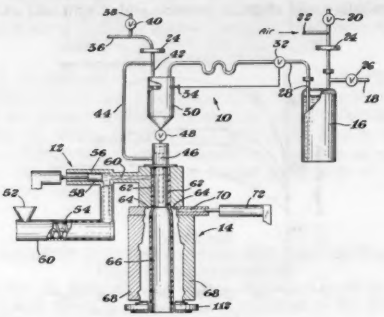
Original application Oct. 3, 1968, Ser. No. 581,931, now Patent No. 3,464,085, dated Sept. 2, 1969. Divided and this application Feb. 5, 1969, Ser. No. 816,444

Int. Cl. B29c *17/07*

U.S. Cl. 264—96 **4 Claims**

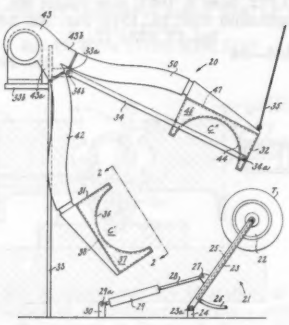
Method for blow molding thermoplastic containers, filling the same with a sterile product immediately upon their formation while the containers are yet in a sterile condition

and sealing the filled containers while they still remain sterile. All of the steps are performed while exposing the



interior of a parison and the container formed therefrom only to a sterile atmosphere.

3,792,145
TIRE PRODUCTION WITH JET AIR COOLING DURING POST INFLATION
Richard H. Hugger, Ridgewood, and George C. Huang, Kinnelon, N.J., assignors to Uniroyal, Inc.
Continuation of application Ser. No. 9,112, Feb. 9, 1970, which is a continuation of application Ser. No. 596,114, Nov. 22, 1966, both now abandoned. This application Sept. 14, 1971, Ser. No. 180,491
Int. Cl. B29h *5/02*
U.S. Cl. 264—100 **12 Claims**



Improvements in tire manufacture, leading to the production of pneumatic tires characterized by optimized sets of circumferentially substantially uniform thermal, physical and geometrical properties, are disclosed. In the course of the mold cycle in the press, such a tire is heated for a predetermined period of time sufficient to impart to the tire a major portion of the final desired cure state to be achieved during the cure cycle which also includes a post inflation cycle outside the press. During the post inflation cycle, cooling air, preferably air taken from the curing room atmosphere itself, is directed in jet form to be incident initially against the tread region of the tire from the exterior of the latter along the entire circumference thereof, the air thereafter flowing at least in part over the sidewall regions of the tire. The air flow conditions are so selected as to achieve in the vicinity of the initial contact of the cooling air with the tire a tire to air heat transfer coefficient ranging from about 15 to about 70 B.t.u./hr./sq. ft./° F. for effecting a rapid and controlled cooling of the tire, and the duration of the jet air cooling is adjusted to be less than the said heating period in the mold but nevertheless still sufficient, despite the rapid cooling, to enable the remaining minor portion of the desired final cure state to be achieved in the course of the post inflation cycle. This abstract is not to be taken either as a complete exposition or as a limitation of the present invention, however, the full nature and extent of the invention being discernible only by reference to and from the entire disclosure.

3,792,146
METHOD OF PREPARING FILMS OF POLYVINYL ALCOHOL RESINS
Saburo Kawamura, Saizo, Taiji Ozaki, Takatsuki, and Saburo Orii, Nara, Japan, assignors to Kuraray Co., Ltd., Sakazu, Kurashiki, Japan
No Drawing. Filed June 8, 1970, Ser. No. 44,568
Claims priority, application Japan, June 10, 1969, 44/45,540
Int. Cl. B29d *7/02*
U.S. Cl. 264—205 **5 Claims**

Molten polyvinyl alcohol resin containing pure water of a resistivity of at least 500,000 ohm-cm. and having a viscosity of 500 to 1200 poises at 130° C., is extruded through a slit at a temperature of 95 to 105° C. onto a drying roll rotated at a speed 5 to 30 times as fast as the calculated discharge speed of the molten polyvinyl alcohol resin.

3,792,147
USE OF COMPOSITIONS BASED ON DIORGANOPOLYSILOXANES WHICH CAN BE CURED AT ROOM TEMPERATURE TO GIVE ELASTOMERS, AS IMPRESSION COMPOSITIONS
Ernst Wohlfarth, Wolfgang Hechtl, Siegfried Nitzsche, and Paul Hittmair, Burghausen, Germany, assignors to Wacker Chemie G.m.b.H., Munich, Germany
No Drawing. Filed Feb. 10, 1972, Ser. No. 225,296
Claims priority, application Germany, Feb. 12, 1971, P 21 06 651.3
Int. Cl. B29c *1/02*
U.S. Cl. 264—225 **25 Claims**

The compositions based on diorganopolysiloxanes, which can be cured at room temperature to give elastomers, which have hitherto been used, in known manner for the manufacture of moulds suffer from the disadvantage that they do not stay in place, that is to say that they run off vertical or inclined surfaces, if they are not prevented from so doing by means of shuttering, before they are cured and/or that the elastomers produced by curing these compositions cannot always be detached from surfaces which are rough or porous in such a way as not to damage the elastomer without the conjoint use of a release agent.

3,792,148
PROCESS FOR THE PREPARATION OF SHAPED ARTICLES FROM POLYAMIDES
Eckart Reske, Hofheim, Taunus, Ludwig Brinkmann, Frankfurt am Main, and Harald Cherdron, Naurod, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany
No Drawing. Filed Apr. 14, 1972, Ser. No. 244,281
Claims priority, application Germany, Apr. 16, 1971, P 21 18 510.4
Int. Cl. B29c *25/00*
U.S. Cl. 264—331 **6 Claims**

There is disclosed and claimed a process for the production of shaped articles from polyamides which exhibit

melting ranges near to or above their decomposition temperatures or poor or no solubility at all in solvents or which exhibit both of these properties at the same time, the process which comprises moulding polyamides carrying substituents of the amide nitrogen and thus having reduced melting ranges and/or improved solubility in solvents, and separating (splitting-off) said substituents partially or totally during and/or after moulding.

3,792,149

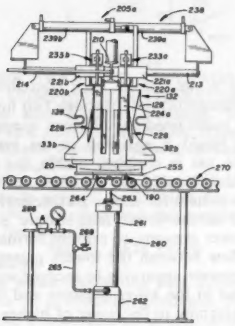
METHOD TO EXTRICATE INTRICATE, CERAMIC SHAPES FROM MULTIPLE PIECE MOLDS

Fred L. Derror, Lucas, Ohio, assignor to Mansfield Sanitary, Inc., Perrysville, Ohio

Original application Oct. 13, 1969, Ser. No. 865,863, now Patent No. 3,671,160. Divided and this application May 3, 1971, Ser. No. 139,350

Int. Cl. B28b *7/08, 7/40*

U.S. Cl. 264—336 **5 Claims**



A method for extricating an intricate ceramic casting from a multiple piece mold. This concept is adapted for use with multiple piece molds which have at least two, opposed, side sections that form a cradle by which the casting may be supported. The cradle is grasped and subsequently positioned at a receiving locus. So positioned, the support for the weight of the casting is shifted from the cradle onto a bat in order that the casting will float within the cradle. Thereafter, the sections of the mold forming the cradle are separated to extricate the casting therefrom. For some ceramic shapes it is highly desirable to invert the cradle prior to the deposit of the casting at the receiving locus. The subject concept includes such a method step.

3,792,150

METHOD OF ROASTING VANADIUM BEARING MATERIALS

John Augustus Maxwell and Michael Wallace Merrill, Soda Springs, Idaho, assignors to Kerr-McGee Chemical Corp., Oklahoma City, Okla.

No Drawing. Filed Mar. 10, 1972, Ser. No. 233,757

Int. Cl. C01g *31/00*

U.S. Cl. 423—68 **9 Claims**

This invention broadly relates to the roasting of vanadium bearing materials and to the recovery of vanadium values from the roasted product. More particularly, the invention relates to an improved process for roasting ferrophosphorus and recovering a high purity vanadium product therefrom.

3,792,151

PROCESS FOR PRODUCING PHOSPHORIC ACID

Everett N. Case, Media, Pa., assignor to Atlantic Richfield Company, New York, N.Y.

Continuation of application Ser. No. 774,960, Nov. 12, 1968. This application Oct. 18, 1971, Ser. No. 190,322

The portion of the term of the patent subsequent to Nov. 9, 1988, has been disclaimed

Int. Cl. C01b *25/16*

U.S. Cl. 423—166 **22 Claims**

A process for the production of phosphoric acid from phosphate rock comprising reacting the phosphate rock with an equilibrated phosphoric acid having a P_2O_5 concentration between about 20 to 50% in an attack stage at a temperature below about 180° F. to dissolve at least about 90% of the phosphate values in the rock and produce a monocalcium phosphate-phosphoric acid-water solution up to about 90% saturated with monocalcium phosphate, reacting sulfuric acid with said solution to produce phosphoric acid and precipitate calcium sulfate, the sulfuric acid being added in an amount essentially stoichiometric with respect to the monocalcium phosphate in the solution, separating the calcium sulfate from the phosphoric acid solution, removing a portion of the phosphoric acid as a product, and recycling the remaining phosphoric acid solution to the attack stage to provide said equilibrated acid.

3,792,152

STABILIZED PHOSPHATE AND DENTIFRICE COMPOSITIONS AND PROCESS FOR PRODUCING SAME

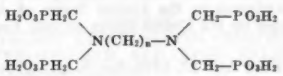
Keun Y. Kim, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Nov. 12, 1971, Ser. No. 198,441

Int. Cl. C01b *15/16, 25/26*

U.S. Cl. 423—311 **6 Claims**

Phosphate salts of metal of Group II of the Periodic Table, especially alkaline-earth metal salts such as dicalcium phosphate, are stabilized against hydrolysis by the incorporation therein of a phosphonic acid of the general formula:



wherein n is from 1 to 10 or a water soluble salt thereof.

3,792,153

METHOD FOR RECOVERING AMMONIA AND HYDROGEN CHLORIDE FROM AMMONIUM CHLORIDE

Scott Lynn, Walnut Creek, Calif., and Richard C. Forrester III, Oak Ridge, Tenn., assignors to The Regents of the University of California, Berkeley, Calif.

No Drawing. Filed Feb. 28, 1972, Ser. No. 230,082

Int. Cl. C01b *25/06*

U.S. Cl. 423—319 **14 Claims**

Ammonia and hydrogen chloride are recovered from ammonium chloride by interaction with magnesium oxide. The magnesium oxide is not lost in the reaction, but is recycled again and again. The free ammonia and hydrogen chloride find utility in many industrial processes, e.g., the production alkali metal bicarbonates and carbonates, ion

exchange regeneration and the like. To be operative in the production process, MgO must be prepared under carefully controlled conditions of temperature.

3,792,154

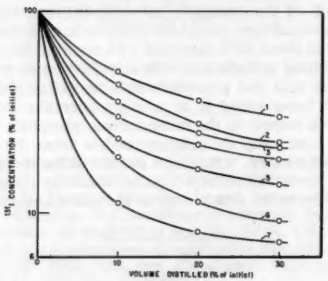
REMOVAL OF IODINE FROM NITRIC ACID SOLUTIONS

George I. Cathers and Calvin J. Shipman, Knoxville, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Mar. 6, 1972, Ser. No. 231,820

Int. Cl. C01b *7/12, 21/38*

U.S. Cl. 423—390 **6 Claims**



A method for removing radioactive iodine from nitric acid solution by isotopically diluting the iodine and autoclaving the solution prior to separation.

3,792,155

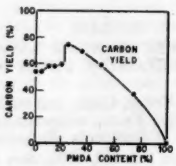
METHOD FOR INCREASING THE CARBON YIELD OF INDENE-DERIVED CARBON PRECURSORS

Wesley E. Smith and Ottis J. Horne, Jr., Oak Ridge, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Apr. 27, 1972, Ser. No. 248,324

Int. Cl. C01b *31/02, 31/04*

U.S. Cl. 423—448 **3 Claims**



The carbon yield of carbon precursors is substantially increased and the microstructure of graphite prepared from this carbon is reproducibly controlled by the addition of selected quantities of pyromellitic dianhydride to the carbon precursors.

3,792,156

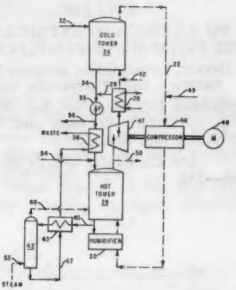
DUAL PRESSURE-DUAL TEMPERATURE ISOTOPE EXCHANGE PROCESS

Dale F. Babcock, Wilmington, Del., assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed June 21, 1972, Ser. No. 265,059

Int. Cl. C01b *5/02, 17/16*

U.S. Cl. 423—580 **3 Claims**



A liquid and a gas stream, each containing a desired isotope, flow countercurrently through two liquid-gas contacting towers maintained at different temperatures and pressures. The liquid is enriched in the isotope in one tower while the gas is enriched within the other and a portion of at least one of the enriched streams is withdrawn from the system for use or further enrichment. The tower operated at the lower temperature is also maintained at the lower pressure to prevent formation of solid solvates. Gas flow between the towers passes through an expander-compressor apparatus to recover work from the expansion of gas to the lower pressure and thereby compress the gas returning to the tower of higher pressure.

3,792,157

STABLE TABLETS CONTAINING BENZODIAZEPINE AND AMITRIPTYLINE

Prabhakar Ranchhordas Sheth, Nanuet, N.Y., and John James Vance, Montvale, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Jan. 10, 1972, Ser. No. 216,780

Int. Cl. B44d *11/08;* **A61k** *9/00*

U.S. Cl. 424—35 **8 Claims**

Stable, film-coated tablets containing a benzodiazepine, such as chlordiazepoxide, and amitriptyline are described. Also described is a method for producing such tablets by utilizing a heating step.

3,792,158

METAL HALIDE-ESTER REACTION PROCESS AND COMPOSITIONS

Marvin Michael Fein and John James Roderick, Paramus, N.J., assignors to Dart Industries, Inc., Los Angeles, Calif.

No Drawing. Original application May 28, 1971, Ser. No. 148,122, now Patent No. 3,721,693, dated Nov. 3, 1972. Divided and this application Oct. 2, 1972, Ser. No. 294,045

Int. Cl. A61k *7/00*

U.S. Cl. 424—65 **5 Claims**

New compositions useful as antiperspirants are derived from the reaction of a metal halide Lewis acid with at least

one ester selected from pyrocarbonates, carbonates and ortho formates, with or without subsequent further reaction with an organic hydroxyl-containing compound.

3,792,159
PROCESS FOR PREPARING INJECTIONABLE COMPOSITIONS

Geoffrey Green, Worthing, Brian George Coverell, North Holmwood, and Anthony Michael Pratt, Worthing, England, assignors to Beecham Group Limited, Brentford, Middlesex, England

No Drawing. Filed July 10, 1972, Ser. No. 270,086
Claims priority, application Great Britain, July 13, 1971, 32,780/71
Int. Cl. A61k *23/00*
U.S. Cl. 424—91 **6 Claims**

This invention is concerned with a process for preparing finely divided micro-particles of tyrosine having an allergen dispersed therein. The micro-particles prepared according to the invention may be suspended in a physiologically acceptable liquid carrier to produce an injectionable composition suitable for use in the desensitization of individuals who are sensitive to the allergen.

3,792,160
METHOD OF TREATING INFLAMMATION AND COMPOSITION THEREFOR

Masao Isono and Katsumi Tomoda, Hyogo, Koichi Miyata, Osaka, Mayima Kazutaka, Hyogo, and Reijiro Kodama, Kyoto, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Application Oct. 9, 1969, Ser. No. 868,280, which is a continuation-in-part of application Ser. No. 641,001, May 24, 1967. Divided and this application Jan. 18, 1972, Ser. No. 218,690
Int. Cl. A61k *19/00*
U.S. Cl. 424—94 **4 Claims**

A protease which has strong caseinolytic and fibrinolytic activities is abundantly produced by *Serratia sp.* E–15 when the microorganism is cultivated in a medium containing milk casein and soybean meal extract The protease is recovered from the culture medium and purified, and the purified protease is used as an effective anti-inflammatory agent.

3,792,161
BURN OINTMENT COMPRISING SILVER SULFADIAZINE AND COLLAGENASE

Charles L. Fox, Jr., New York, N.Y., assignor to Research Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 38,031, May 18, 1970, now Patent No. 3,761,590, which is a continuation-in-part of abandoned application Ser. No. 653,830, July 17, 1967. This application Nov. 24, 1970, Ser. No. 92,361
The portion of the term of the patent subsequent to Sept. 25, 1990, has been disclaimed
Int. Cl. A61k *19/00, 27/00*
U.S. Cl. 424—94 **1 Claim**

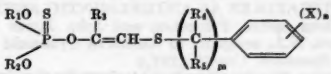
An ointment made of silver sulfadiazine and collagenase dispersed in a non-aqueous hydrophobic carrier, such as petrolatum, has been found to be useful in burn therapy. The silver sulfadiazine is present in the ointment in an effective antibacterial amount, such as an amount in the range from about 0.1 to about 10.0% by weight based on said ointment. The collagenase is present in the ointment usually in an amount in the range from about 0.01–0.05% to about 2.0% by weight based on said ointment. Petrolatum is preferred as the non-aqueous hydrophobic carrier. When applied in burn therapy the silver sulfadiazine component of the ointment is antibacterial, for example, is effective against *Pseudomonas aeruginosa,* and the collagenase component of the ointment appears to improve or accelerate the separation of the eschar and promotes healing.

3,792,162
ARALKYLTHIOVINYL PHOSPHOROTHIOATES USED AS INSECTICIDES AND ACARICIDES

Roger Williams Addor, Pennington, and Thomas Walter Drabb, Jr., Trenton, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of application Ser. No. 95,908, Dec. 7, 1970, now Patent No. 3,718,718. This application Jan. 6, 1972, Ser. No. 215,905
Int. Cl. A01n *9/36*
U.S. Cl. 424—216 **12 Claims**

The acaricidal and insecticidal compounds have the formula:



wherein:

R_1, R_2 and R_3 are each lower alkyl,
R_4 and R_5 are lower alkyl or hydrogen,
X is lower alkyl or halo,
m is 1 or 2, and
n is 0 to 3.

The trans and cis isomeric forms of the above compounds as well as mixtures of the trans and cis forms are embraced by the scope of the above formula.

3,792,163
EGG DECORATING DEVICE

Stanley J. Fudro, Minneapolis, Minn., assignor to Toys 'N Things, Inc., Minneapolis, Minn.

Filed May 8, 1972, Ser. No. 251,337
Int. Cl. B43l *9/00, 11/00, 13/00*
U.S. Cl. 33—21 D **15 Claims**

Apparatus for decorating eggs and the like. The apparatus includes means for supporting an egg for rotation about its longitudinal axis and an arm member adapted to carry a marking device and arranged for marking movement longitudinally of the egg. Coordinated rotation of the egg and manipulation of the arm member together result in creating decorative marking on the egg.

3,792,164
OPHTHALMIC COMPOSITION COMPRISING WATER-SOLUBLE ALKALOID SALTS OF POLYURONIC ACIDS

Arthur W. Bechtold, Boonton, N.J., assignor to Chemway Corporation, Wayne, N.J.

No Drawing. Continuation-in-part of application Ser. No. 561,325, June 29, 1966. This application Mar. 31, 1970, Ser. No. 24,352
Int. Cl. A61k *27/00*
U.S. Cl. 424—180 **1 Claim**

Water-soluble salts are provided by reacting in aqueous solution approximately equivalent amounts of a polyuronic acid selected from the group consisting of polymannuronic acid, polyglucuronic acid and polygalacturonic acid and an alkaloid, selected from the group consisting of pilocarpine, atropine, eserine, ephedrine, benoxinate, chlorpheniramine, procaine, tetracaine, cocaine, phenylephrine, homatropine, amphetamine and epinephrine. The water-soluble salts are useful in the preparation of anesthetics, antihistamines, vasoconstrictors, miotics and mydriatics. Of particular importance to the invention, is the fact that when in solution such salts provide a dramatic increase in the duration of therapeutic activity which may be achieved, particularly with regard to miotics and mydriatics.

3,792,165

PHOSPHINE OR PHOSPHITE GOLD COMPLEXES OF THIOMALIC ACID IN TREATING ARTHRITIS

Elizabeth R. McGusty, Philadelphia, and Blaine M. Sutton, Hatboro, Pa., assignors to Smithkline Corporation, Philadelphia, Pa.

No Drawing. Original application Apr. 27, 1971, Ser. No. 137,961, now Patent No. 3,718,679. Divided and this application Nov. 13, 1972, Ser. No. 306,266

Int. Cl. A61k *27/00*

U.S. Cl. 424—215 **7 Claims**

Phosphine or phosphite gold complexes of thiomalic acid having anti-arthritic activity are prepared by reaction of an appropraite phosphine or phosphite gold halide with thiomalic acid.

3,792,166

METHOD OF USING SUBSTITUTED IMIDAZO [2,1-b]THIAZOLES AS ANTHELMINTIC AGENTS

Larry Dean Spicer, Princeton, and John James Hand, Trenton, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of application Ser. No. 90,141, Nov. 16, 1970, now Patent No. 3,708,490, which is a continuation-in-part of abandoned application Ser. No. 3,220, Jan. 15, 1970. This application Mar. 13, 1972, Ser. No. 234,323

Int. Cl. A61k *27/00*

U.S. Cl. 424—270 **9 Claims**

The preparation of acyl substituted phenylimidazo[2,1-b]thiazoles found useful for the control of helminths in warm-blooded animals, is described.

3,792,167

NAPHTHYL ALKANOLS AND DERIVATIVES THEREOF, METHODS OF USE THEREOF, AND PROCESSES FOR THE PREPARATION THEREOF

John H. Fried and Ian T. Harrison, Palo Alto, Calif., assignors to Syntex Corporation, Panama, Panama

No Drawing. Original application July 2, 1968, Ser. No. 741,904, now Patent No. 3,641,161. Divided and this application Oct. 15, 1971, Ser. No. 189,561

Int. Cl. A61k *27/00*

U.S. Cl. 424—337 **26 Claims**

(β-[2-naphthyl] ethanols optionally substituted at the β-position and/or positions C–1, 4, 5, 7 or 8; and/or position C–6 possess anti-inflammatory, analgesic, anti-pyretic and antipruritic activity.

3,792,168

ETHYNYLENE CONTAINING N-PHENYL CARBAMATES AND THEIR USE AS ACARICIDES AND INSECTICIDES

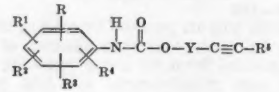
Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Original application Aug. 1, 1969, Ser. No. 846,920, now Patent No. 3,660,465. Divided and this application Sept. 7, 1971, Ser. No. 178,486

Int. Cl. A01n *9/20*

U.S. Cl. 424—300 **7 Claims**

Compounds of the formula



in which R is

(a) hydrogen,
(b) alkyl,
(c) nitro,
(d) halo,
(e) hydroxy,
(f) alkoxy,
(g) alkylthio, or
(h) phenyl,

R^1 is

(a) hydrogen,
(b) alkyl,
(c) nitro,
(d) halo,
(e) hydroxy, or
(f) alkoxy,

R^2 is

(a) hydrogen,
(b) methyl,
(c) halo, or
(d) alkoxy,

R^3 is

(a) hydrogen,
(b) methyl, or
(c) halo,

R^4 is

(a) hydrogen,
(b) methyl, or
(c) halo,

Y is a divalent lower alkenyl, lower alkynyl or lower alkyl radical either straight or branched chain, and R^5 is an alkyl, cycloalkyl or alkenyl group and their use as acaricides and insecticides.

3,792,169

N-SUBSTITUTED ARYL CARBAMATES AS INSECTICIDES

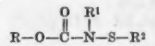
Melancthon S. Brown and Gustave K. Hohn, Berkeley, Calif., assignors to Chevron Research Company, San Francisco, Calif.

No Drawing. Application Sept. 4, 1969, Ser. No. 855,421, now Patent No. 3,663,594, which is a continuation-in-part of abandoned application Ser. No. 764,299, Oct. 1, 1968. Divided and this application Feb. 28, 1972, Ser. No. 230,117

Int. Cl. A01n *9/12*

U.S. Cl. 424—300 **11 Claims**

Insecticidal carbamates of the formula



wherein R is aryl or aralkyl of 6 to 20 carbon atoms, R^1 is H or alkyl of 1 to 6 carbon atoms, and R^2 is alkyl of 1 to 10 carbon atoms or monocyclic aryl of 6 to 12 carbon atoms substituted with 0 to 2 alkyl in which the total number of carbon atoms in the alkyl groups combined is 1 to 6, 0 to 2 halogens of atomic number 17 to 35 or 0 to 2 trifluoromethyl.

3,792,170

NOVEL ALKYLSULFINYL DERIVATIVES FOR PAIN, FEVER AND INFLAMMATION

Tsung-Ying Shen and Bruce E. Witzel, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Mar. 14, 1972, Ser. No. 234,659

Int. Cl. A61k *27/00*

U.S. Cl. 424—303 **14 Claims**

Novel alkylsulfinyl derivatives which find use as anti-inflammatory, analgestic and antipyretic agents.

ERRATUM

For Class 424—318 see:
Patent No. 3,792,179

3,792,171

MANUFACTURE OF CHEESE CURD

Lawrence L. Little, 1600 Renoir Lane, Creve Coeur, Mo. 63141

No Drawing. Continuation-in-part of abandoned application Ser. No. 79,363, Oct. 8, 1970. This application Nov. 13, 1972, Ser. No. 306,161

Int. Cl. A23c *19/02*

U.S. Cl. 426—38 **26 Claims**

Milk is acidified by mixing solid, soluble acid particles therewith that have been coated with a material that will disperse or dissolve in the liquid milk media at a rate to

delay dissolution of the acid particles and effect relatively slow and uniform acidification. In another embodiment such particles are added to milk prior to syneresis of the protein content of the milk and prior to any substantial dissolution of the particles so that coated particles are entrapped in the resultant curd and such curd is further acidified after its formation.

3,792,172
ARTIFICIAL FEED FOR WILD SILKWORMS
Minoru Shirota, Tetsuo Fukada, and Mayumi Ogata, Kyoto, Toshiaki Takahashi, Nishinomiya, and Hiromi Yamada, Uji, Japan, assignors to Kabushiki Kaisha Yakult Honsha, Tokyo, and Hiromi Yamada, City of Uji, Japan
No Drawing. Filed Dec. 27, 1971, Ser. No. 212,538
Claims priority, application Japan, Dec. 25, 1970, 45/117,858
Int. Cl. A23k *1/18*
U.S. Cl. 426—72 **1 Claim**

Artificial feeds for wild silkworms consisting of the conventional artificial feed containing leaves willingly taken by them and the unicellular green algae such as chlorella or scenedesmus.

3,792,173
PROCESS OF REDUCING SHRINKAGE AND RETAINING MOISTURE AND JUICES IN MEAT PRODUCTS AND PRODUCTS PRODUCED THEREBY
Elmer F. Glabe, Chicago, Ill., assignor to Food Technology, Inc., Chicago, Ill.
No Drawing. Filed Dec. 22, 1971, Ser. No. 211,033
Int. Cl. A22c *11/00, 18/00*
U.S. Cl. 426—92 **11 Claims**

Shrinkage of meat products is reduced and moisture and juices are retained by coating meat products with a powder consisting essentially of a dehydrated mixture of a sugary syrup, in which the solids are mainly monosaccharides or both mono- and disaccharides, with or without minor amounts of higher saccharides, and a partially gelatinized starch of a type having a gelatinization temperature of at least 150° F. The resultant meat products, upon cooking, not only lose less weight but also have a softer texture and an improved flavor due to greater retention of the natural juices. The invention is especially useful for comminuted meats, for example, sausages, hamburger, frankfurters, and meat loaves, but is also applicable to integral meat units in which the meat has not been comminuted.

3,792,174
FLOUR MIX FOR PREPARING TORTILLAS
Ruben G. Duarte and Manuel George Duarte, both of 1012 Nevada St., El Paso, Tex. 79902
No Drawing. Filed Mar. 10, 1971, Ser. No. 123,021
Int. Cl. A21d *2/00;* **A23d** *1/10*
U.S. Cl. 426—152 **4 Claims**

A culinary mixture is provided from which tortillas may be prepared which comprises a substantial portion of wheat flour together with about 14–16 weight percent shortening, about 1–1.5 weight percent baking powder, about 1–1.5 weight percent salt, about 2–3 weight percent powdered milk, about 2–2.5 weight percent emulsifier, and about .1–.2 weight percent spoilage retarder.

3,792,175
FIBRILLAR SOY WHEY PROTEIN COMPLEX
Edward Emil Schmitt, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.
Filed Oct. 21, 1971, Ser. No. 191,271
Int. Cl. A23j *3/00*
U.S. Cl. 426—364 **7 Claims**

A fibrillar soy whey protein complex is produced by contacting soy whey with a polysaccharide solution containing carrageenan at a pH ranging from about 3.85 to about 4.35 with stirring.

3,792,176
METHOD FOR MAKING PASTRY DOUGHS
Eric M. Van Patten, Tinley Park, and Dale H. O'Rell and Leonard B. Kondrot, Chicago, Ill., assignors to American Maize-Products Company
No Drawing. Filed Mar. 2, 1972, Ser. No. 231,415
Int. Cl. A21d *2/00, 8/00*
U.S. Cl. 426—157 **5 Claims**

An improved dough for nonleavened pastries, especially fruit and meat pies, is disclosed. By the addition of from about 1% to about 10% of an unmodified high amylose starch, the pastry dough is made more easy to process and in addition the crusts do not become soggy when baked out.

3,792,177
PHOSPHATE-HYDROGEN PEROXIDE ADDUCT AS A FOOD PRESERVATIVE
Hiromi Nakatani and Kiyoshi Katagiri, Kyoto, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan
No Drawing. Filed Feb. 5, 1969, Ser. No. 796,891
Claims priority, application Japan, Feb. 7, 1968, 43/7,589
The portion of the term of the patent subsequent to Dec. 8, 1989, has been disclaimed
Int. Cl. A23f *1/06*
U.S. Cl. 426—178 **9 Claims**

By admixing an acid metal phosphate with water-soluble metal phosphate-hydrogen peroxide adducts, the deleterious effects thereof on food products to which they are added as stabilizers due to their alkalinity are overcome.

3,792,178
SOUR CREAM POWDER
Peter P. Noznick, Charles W. Tatter, and Carl F. Obenauf, Chicago, Ill., assignors to Beatrice Foods Co., Chicago, Ill.
No Drawing. Continuation-in-part of applications Ser. No. 825,675, July 8, 1959, Ser. No. 16,652, Mar. 22, 1960, Ser. No. 149,537, Nov. 2, 1961, and Ser. No. 197,837, May 28, 1962, all now abandoned. This application May 10, 1968, Ser. No. 728,317
Int. Cl. A23c *9/12*
U.S. Cl. 426—187 **25 Claims**

Sour cream powder is prepared by adding a coating assisting agent selected from the group consisting of gum acacia, gum tragacanth, corn, wheat and potato starches, acid modified starches, phosphated starches, enzyme modified starches of the previous group, dextrins, pectins, carboxymethyl cellulose, nonfat milk solids, gelatin and casein, homogenizing the mixture and spray drying. Preferably a phosphate is added as a protein peptizing agent. The products with or without the peptizing agent are readily redispersible in water to give stable emulsion.

3,792,179
TRANQUILIZING METHOD EMPLOYING ARACHIDONIC ACID
Walter Joseph Potts, Glenview, Ill., assignor to G. D. Searle & Co., Chicago, Ill.
No Drawing. Filed June 9, 1971, Ser. No. 151,564
Int. Cl. A61k *27/00*
U.S. Cl. 424—318 **1 Claim**

The administration of tranquilizing amounts of a prostaglandin such as PGE_1, PGE_2 and PGA_2 or of a prostaglandin precursor such as arachidonic acid to mammals results in tranquilization as contrasted to generalized depression.

3,792,180

ADDING FAT ADJUVANTS TO FOODS IN AN EBULLIENT FREEZANT

Kavsy D. Dastur, Yorklyn, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed July 30, 1971, Ser. No. 167,835
Int. Cl. A23 *1/00*
U.S. Cl. 426—524 **3 Claims**

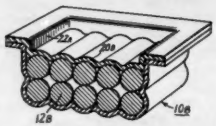
A process for adding food adjuvants to foods which comprises contacting the surface of the foods with a dispersion of the food adjuvant in a saturated fluorinated liquid chlorohydrocarbon freezant having a normal boiling point of 5° C. to —50° C.

3,792,181

SEMI-RIGID PLASTIC PACKAGE WITH RECLOSABLE SEAL

Reid A. Mahaffy, Montclair, and Joel A. Hamilton, Englewood, N.J., assignors to Mahaffy & Harder Engineering Company, Totowa, N.J.

Filed Sept. 24, 1969, Ser. No. 860,590
Int. Cl. B65b *25/00*
U.S. Cl. 426—123 **13 Claims**



A package comprising a receptacle cup of semi-rigid plastic having a top of semi-rigid plastic sealed to flanges of the receptacle and formed inwardly to press against the packaged product and hold it in place with or without evacuation of the interior. Different techniques and apparatus are disclosed for forming such packages. Package configurations also are disclosed providing improved reclosable characteristics, wherein the semi-rigid nature of both the top and the cup are utilized to enable the reclosed top to be held securely in place.

3,792,182

MACHINE AND METHOD FOR MAKING A SOFT ICE PRODUCT FORMED OF FROZEN AIR-AND-GELATIN DISPERSION

Poerio Carpigiani, Anzola Emilia, Bologna, Italy

Continuation-in-part of abandoned application Ser. No. 8,529, Feb. 4, 1970. This application Apr. 10, 1972, Ser. No. 242,756
Int. Cl. A23g *5/00;* **F25c** *7/14*
U.S. Cl. 426—250 **10 Claims**

Making an edible frozen food product by subjecting an aqueous solution containing between about 5% and about 30% by weight of gelatin to sufficient heat to bring the solution above its melting and gelation temperatures, maintaining the aqueous solution at a first temperature range T_1 at or above its melting and gelation temperatures while mixing air into said aqueous solution to form a foam, feeding the foam into a refrigerated chamber to precool said foam, and simultaneously further cooling to a second temperature range T_2 below its freezing point annd whiping said foam initially cooled in the refrigerated chamber to produce a soft frozen dispensable food product.

3,792,183

CEREAL COATING COMPOSITION AND PROCESS

Angus Alexander Lyall, Niagara Falls, Ontario, Canada, and Cecil Norton Lundy, Hawthorne, N.J., assignors to Nabisco, Inc., New York, N.Y.

Filed Aug. 10, 1971, Ser. No. 170,510
Int. Cl. A23l *1/10, 1/08*
U.S. Cl. 426—307 **24 Claims**

A syrup solution containing, by weight, 60–85% sugar solids, is made up, and is applied to a cereal base without heating. The sugar solids comprise by weight, based on the total sugar solids, on a dry basis, from about 80% to about 68% sucrose solids and about 20–32% low dextrose equivalent glucose solids. After coating, the product is subjected to substantial heat in a dry apparatus for 20–28 minutes, and the drying is effected with substantial agitation of the coated cereal particles. A hard, glossy, non-hydroscopic transparent cereal coating is obtained which does not crystallize or decrease in glossiness even after extended shelf life.

3,792,184

FREEZING AND THAWING PROCESS FOR REMOVING PRECIPITATING SUBSTANCES FROM PLANT EXTRACTS

Kaoru Inagami and Hidemoto Kamada, Tokyo, Japan, assignors to The Calpis Food Industry Co., Ltd., Tokyo, Japan

No Drawing. Filed Nov. 4, 1971, Ser. No. 195,636
Claims priority, application Japan, Nov. 14, 1970, 45/100,313
Int. Cl. A23l *1/28*
U.S. Cl. 426—369 **4 Claims**

Plant extracts (such as extracts from cocoa powder or cinnamon powder) which contains colloidal particles have the undesirable precipitating substances therein (such as proteins or high polymer carbohydrates) removed by freezing the extract to —12° C. or lower and then raising the temperature to 5° C. to thaw the extract, the pH of the extract being between 3 and 5. The precipitate is then removed by filtering or centrifuging the extract.

ELECTRICAL

3,792,185
CHANNEL-TYPE INDUCTION FURNACE

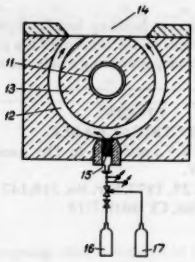
Kare Folgero, Vasteras, and Sven Hellsing, Finspong, both of Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Aug. 24, 1972, Ser. No. 283,425

Claims priority, application Sweden, Sept. 9, 1971, 11412/71

Int. Cl. F27d *11/06*; **H05b** *5/14*

U.S. Cl. 13—29 **7 Claims**



Channel type induction furnace provided with a nozzle for blowing gas into the channel at a position which prevents formation of oxides and the like due to eddy currents.

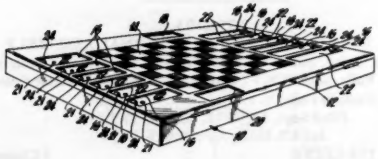
3,792,186
GAME APPARATUS

Angelo Principe, 19 Dublin Ln., Hazlet, N.J.

Filed Nov. 6, 1972, Ser. No. 304,339

Int. Cl. G09b *19/22*

U.S. Cl. 35—8 B **5 Claims**



A game apparatus is described herein for self-teaching board games such as chess, checkers and the like. Game pieces and a game board having windows formed therein are provided and a mounting panel is operatively associated with the board for locking an instruction card in spaced relationship beneath the game board. The card is properly positioned, when locked, so as to present instructions through the windows of the game board. Shutter panels are operatively mounted on the board for incrementally exposing portions of the card through the windows. Detents may be provided for locking each shutter into position at each increment between the entirely opened and the entirely closed positions of the shutter.

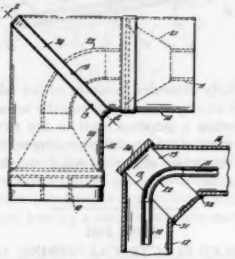
3,792,187
VOLTAGE GRADING SHIELD FOR SHARP ANGLE TRANSITION JOINT

John J. Depcrymski, Greensburg, Pa., assignor to I.T.E. Imperial Corporation, Spring House, Pa.

Filed May 21, 1973, Ser. No. 362,323

Int. Cl. H02g *15/24*; **H01b** *9/04*

U.S. Cl. 174—21 C **11 Claims**



A sharp angle transition joint for rigid coaxial gas-insulated systems is provided by an oval ring formed from a flat strip of conductive material. The ring overlaps the mitered spaced parallel edges of two concentric, outer housings and is welded to the edges of the housings.

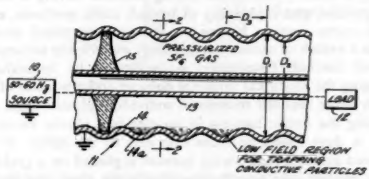
3,792,188
CONDUCTIVE PARTICLE TRAP FOR HIGH-POWER, GAS-INSULATED TRANSMISSION SYSTEM

John C. Cronin, Greensburg, Pa., assignor to I.T.E. Imperial Corporation, Philadelphia, Pa.

Filed Aug. 21, 1972, Ser. No. 282,366

Int. Cl. H01b *9/06*

U.S. Cl. 174—28 **4 Claims**



A method of placing a low-frequency, high voltage, gas-filled power transmission system into service by applying a conditioning voltage to the system prior to application of system voltage.

3,792,189
TELESCOPIC CABLE GUIDE

Max Stengel; Werner Kollmer, and Manfred Grassl, all of Munich, Germany, assignors to Messerschmit-Bolkow-Blohm GmbH, Munich, Germany

Filed July 24, 1972, Ser. No. 274,492

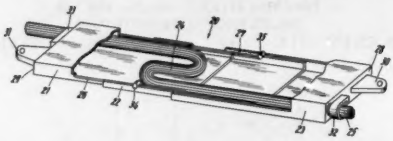
Claims priority, application Germany, Feb. 11, 1972, 2206404

Int. Cl. H01b *7/06*

U.S. Cl. 174—69 **7 Claims**

Telescopic guide for conducting a flexible cable between relatively moving parts. For positioning between relatively

moving parts, such as an aircraft fuselage and a swingable wing connected thereto, there is provided a housing comprising telescopic parts, said housing being positioned between the relatively moving parts and conducting the cable therethrough. The cable is clamped at either end of the housing and a loop maintained in the cable in at least all positions



other than the fully extended position of the telescopic housing. Pin and slot arrangements between the telescopic parts of the housing provide a positive limit to the extension of the housing and thereby assure that the housing will not be unduly extended and result in either damage to the housing or damage to the cable.

3,792,190

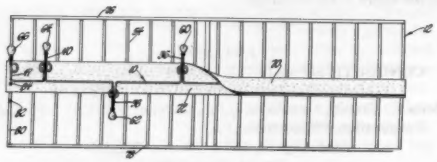
PREASSEMBLED ELECTRICAL WIRING APPARATUS AND METHOD OF INSTALLATION THEREOF

Robert L. Schultz, Tecumseh, Mich.

Filed Nov. 16, 1972, Ser. No. 307,273

Int. Cl. H02g *3/02, 1/00;* **B65d** *85/00*

U.S. Cl. 174—72 R **13 Claims**



A method and apparatus for wiring a building structure including a factory-assembled wiring harness having a trunk cable portion and a plurality of branch cable portions, each branch cable portion having an electrical terminal device, such as a switch or outlet, permanently electrically secured to the end thereof. Installation is facilitated by individually packaging the electrical terminal devices and a portion of the branch cable secured thereto in individual plastic bags, and wrapping the entire harness in an elongate plastic envelope which is then rolled up from one end to the other. In the preferred example, the wiring harness is placed on a grid-like ceiling module and unrolled longitudinally from one end to the other. The envelope is opened and the individual terminal devices are extended outwardly therefrom and tacked in place and left hanging around the outside of the ceiling module. After the ceiling module is disposed on the walls, the electrical terminal device packages are opened to allow the devices to fall to their full vertical extension and secured in place. Outer peripheral notches and protective plates are employed to provide raceways or channels for the electrical wiring.

3,792,191

ENCLOSURE FOR CONDUCTOR OF ELECTRICAL TRANSMISSION SYSTEM

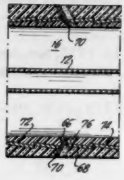
Elijah Robert Perry, Scottdale; John C. Cronin, and Howard W. Graybill, both of Greensburg, all of Pa., assignors to ITE Imperial Corporation, Spring House, Pa.

Filed Dec. 26, 1972, Ser. No. 318,693

Int. Cl. H02g *15/24;* **H01b** *9/04*

U.S. Cl. 174—84 R **5 Claims**

Tubular enclosure for a high voltage conductor: the enclosure comprises a nonconductive glass reinforced plastic material pipe which serves as the gas pressure vessel for a dielectric gas within the pipe; a wound conductive foil electric ground shield is incorporated into the nonconductive layer.



The joint between adjacent housing lengths is sealed with a conductive epoxy; a means on the interior of the joint prevents the bonding adhesive from penetrating inside the housing.

3,792,192

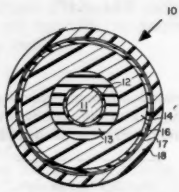
ELECTRICAL CABLE

Walter J. Plate, Rye, N.Y., assignor to The Anaconda Company, New York, N.Y.

Filed Dec. 29, 1972, Ser. No. 319,147

Int. Cl. H01b *7/18*

U.S. Cl. 174—102 SC **16 Claims**



An electric power cable comprises extruded strand shielding and an inner layer of rubber insulation such as ethylene-propylene copolymer or ethylene-propylene-diene terpolymer rubber bonded by cross-linking to an outer layer of cross-linked polyethylene insulation.

3,792,193

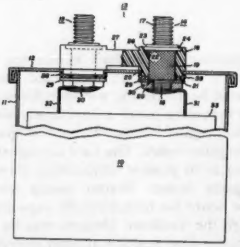
DUAL BUSHING CAPACITOR TERMINAL ASSEMBLY

Frank D. Price, South Glens Falls, and Richard G. Conners, Glens Falls, both of N.Y., assignors to General Electric Company, Hudson Falls, N.Y.

Filed Sept. 14, 1972, Ser. No. 289,174

Int. Cl. H01g *1/14;* **H01b** *17/30*

U.S. Cl. 174—153 R **4 Claims**



A dual bushing terminal assembly is disclosed for capacitors. The dual bushing comprises a pair of separate capacitor

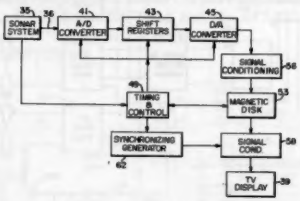
electrical terminals molded or cast in a single piece of an insulating material, and the dual bushing assembly is then sealed in a capacitor cover.

3,792,194

SCAN CONVERSION APPARATUS

Kenneth E. Wood, Annapolis; William F. Parrish, Baltimore, both of Md., and Paul G. Kennedy, Monroeville, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 5, 1972, Ser. No. 259,625
Int. Cl. H04n *5/02, 5/78, 7/18*
U.S. Cl. 178—6.8 **14 Claims**



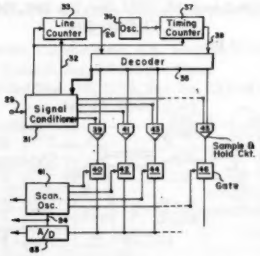
A video magnetic disk is utilized in the conversion of side looking sonar or slow scan TV data into a form suitable for displaying as a flicker-free picture on a conventional TV monitor. In the side looking sonar mode of operation, provision is made for displaying the sonar information as a moving window display.

3,792,195

SIGNAL MONITOR FOR RECURRENT ELECTRICAL SIGNALS

Kenneth A. Wilson, Locust Valley, N.Y., and Graham D. Bogel, Woodbury, Conn., assignors to American Chain & Cable Company, Inc., New York, N.Y.

Filed May 25, 1972, Ser. No. 256,917
Int. Cl. H04n *7/02*
U.S. Cl. 178—6.8 **11 Claims**



A television signal monitor for detecting and isolating selected portions of a composite television signal. The isolated portions of the television signal are temporarily stored in analog form in a plurality of parallel aligned sample and hold circuits. The sample and hold circuits are selectively gated by a programable counter-decoder circuit which generates gating pulses of selected duration at predetermined time intervals during the horizontal line intervals. The stored signals are sequentially sampled and converted to binary coded decimal form and then serially fed to a storage circuit or to a utilization circuit.

3,792,196

PICTURE TRANSMISSION SYSTEM

Broder Wendland, Ay/Iller, Germany, assignor to Licentia Patent-Verwaltungs GmbH, Frankfurt am Main, Germany

Filed June 23, 1972, Ser. No. 265,795
Claims priority, application Germany, June 24, 1971, 2131311
Int. Cl. H04n *3/34, 5/04*
U.S. Cl. 178—6.8 **11 Claims**

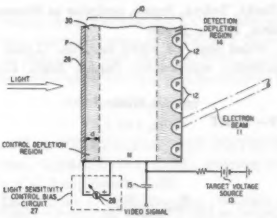
A television system in which, at both the transmitting end and the receiving end, the picture is scanned by an undulating scanning beam which during each horizontal scanning period scans picture elements lying in a plurality of adjacent rows, the undulating beam tracing a path which alternates between the rows.

3,792,197

SOLID-STATE DIODE ARRAY CAMERA TUBE HAVING ELECTRONIC CONTROL OF LIGHT SENSITIVITY

Sooyoung Chai, Madison Township, Middlesex, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed July 31, 1972, Ser. No. 276,291
Int. Cl. H04n *5/30*
U.S. Cl. 178—7.1 **6 Claims**



A silicon diode array target structure is disclosed in which light sensitivity is electronically controlled. Photons incident upon a target generate hole (minority carrier) electron pairs. A single large area reversed bias P-N junction structure is formed over the entire image area on the light incident side of a conventional diode array target, and the depletion region created by the reverse bias both controls light sensitivity by impeding the movement of minority carriers toward the diode array target and serves as a sink for the minority carriers generated within the depletion region.

3,792,198

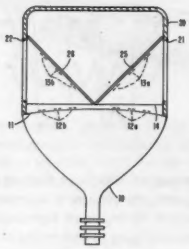
PARTITION SYSTEM FOR IMAGE DISPLAYS

Charles C. Hanson, and Lyle T. Lemke, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 28, 1972, Ser. No. 293,200
Int. Cl. H04n *5/72, 7/08*
U.S. Cl. 178—7.91 **5 Claims**

A louvered film is positioned over the screen of an image display device such as a cathode ray tube to divide the screen

into discrete viewable portions discernable only from predetermined viewing angles to enable viewers at different viewing angles to see only one of the viewable portions. In one embodiment, the louvers in the film restrict the viewing angle in a direction normal to the face of the cathode ray tube. A pair of mirrors are positioned at angles with respect to each other and the louvered film whereby viewers facing each other



are restricted to viewing different discrete areas on the cathode ray tube screen. By partitioning the screen into discrete viewing areas, a single display device can function as multiple display devices.

In another embodiment, instead of using mirrors, the louvers in the film are positioned at a different angle for each viewing area whereby side by side viewers see discrete viewing areas from predetermined viewing angles.

3,792,199

REPRODUCER DEVICE FOR FM STEREO MULTIPLEX SIGNALS

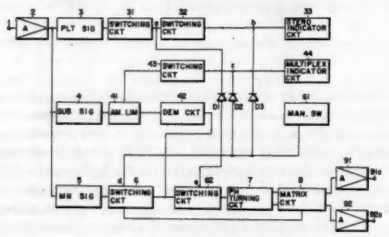
Yoshifumi Saeki, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sept. 14, 1970, Ser. No. 72,086

Claims priority, application Japan, Sept. 13, 1969, 44-72318

Int. Cl. H04h *5/00*

U.S. Cl. 179—15 BT **1 Claim**



A receiving and reproducing device for multiplex broadcast signals whereby a monaural and a stereo signal can be received and further a multiplex signal which contains two independent signals, for example, a Japanese language signal and another language signal can be received and selectively reproduced. When a stereo signal is received, each circuit of this device automatically operates so as to reproduce the stereo signal. When a multiplex signal other than a stereo signal is received, each circuit operates so as to reproduce a main signal or a sub-signal of the multiplex signal according to the predetermined selection.

3,792,200

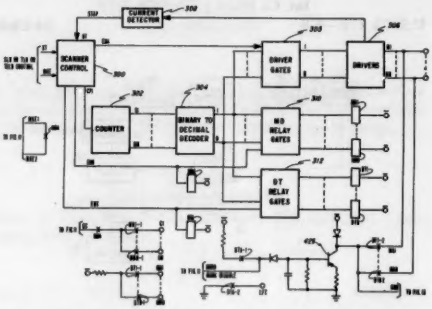
MATRIX SWITCHING NETWORK CONTROL LINK INTERCONNECTION CIRCUIT

Otto Altenburger, Rochester, N.Y., and Robert H. Bansemir, Northlake, Ill., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Division of Ser. No. 153,221, June 15, 1971, Pat. No. 3,729,593. This application Nov. 3, 1972, Ser. No. 303,566

Int. Cl. H04q *3/42*

U.S. Cl. 179—18 GE **3 Claims**



Matrix connector circuits for connection in series with separate groups of control links of a matrix switching network at the point at which the control links define unique paths between circuits connected to opposite ends of the network. The matrix connector circuits initially complete all the control links during the initial scanning steps in a path finding sequence. In the last scanning step, all the matrix connector circuits open all the control links while a selected matrix connector allows the scanning of its control links and allows the application of energization signals to opposite portions of a selected control link to complete the corresponding unique path through the network.

3,792,201

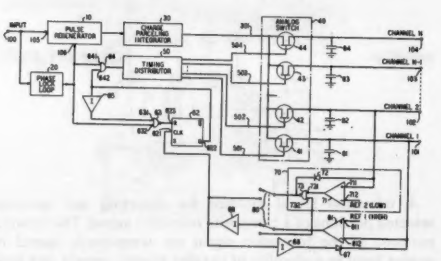
TIME-DIVISION MULTIPLEX FRAMING CIRCUIT

Thomas Lawrence Osborne, Georgetown, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 15, 1972, Ser. No. 280,796

Int. Cl. H04j *3/06*

U.S. Cl. 179—15 BS **6 Claims**



A framing circuit for use in time-division multiplex decoders utilizes a digital "1" in the first timing slot in each frame of input data to synchronize the decoder. In the decoder, the input signal is demultiplexed into separate information channels which are separately decoded. The output signal of the first channel is then applied to a threshold detec-

tor. If the decoder is in-frame, the threshold detector will indicate that the output of the first channel is higher than the reference level of the detector. When the decoder is out-of-frame, the first channel output will vary randomly, falling below the threshold level. This will cause a signal to be generated which will block one of the timing pulses to the demultiplexer, thereby causing the relative channel locations to change by one position. This is repeated until the first framing time slot corresponds to the first decoded channel.

3,792,202

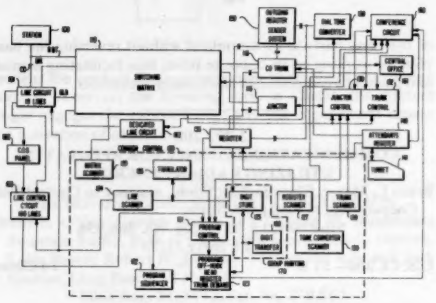
DIAL UP CONFERENCE CIRCUIT

John A. Adams, Jr., Altamonte Springs, Fla.; Ernest D. Lee, Jr., Fairport, and Karl Wichlajew, Penfield, both of N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Apr. 26, 1972, Ser. No. 247,832

Int. Cl. H04m *3/56*

U.S. Cl. 179—18 BC **20 Claims**



A conference circuit for an automatic telephone system is provided with a dedicated line circuit in addition to plurality of party stations, each of which is connected to the concentrator matrix of the system. Through the system a conference may be set up by a local party dialing the conference code, by a distant party, connected via a trunk, which has been extended by an attendant to a dedicated line circuit, through the attendant's turret, or by transfer of a trunk connection via a local party and code dialing.

3,792,203

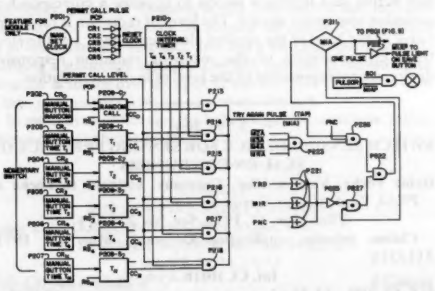
AUTOMATIC REDIAL MEMORY DEVICE FOR TELEPHONES

David B. Martin, Cumberland, R.I., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Mar. 10, 1972, Ser. No. 233,647

Int. Cl. H04m *1/44*

U.S. Cl. 179—90 B **19 Claims**



An automatic redial memory device for use with the telephone system which electronically stores a previously dialed number and then subsequently retransmits that number via the telephone apparatus, either on a timed interval basis or at random times upon the activation of an appropriate select switch. A plurality of shift registers comprise a module register which stores a plurality of dialed telephone numbers comprising a telephone address. Selection circuitry permits the transmission and/or retransmission of the stored numbers at predetermined intervals or at random times by enabling selected ones of a plurality of AND gates to provide transmission pulses.

3,792,204

ACOUSTIC TRANSDUCER USING A PIEZOELECTRIC POLYVINYLIDENE FLUORIDE RESIN FILM AS THE OSCILLATOR

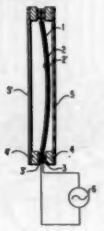
Naohiro Murayama, and Takao Okiawa, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 3, 1971, Ser. No. 204,584

Claims priority, application Japan, Dec. 4, 1970, 45-106710

Int. Cl. H04r *17/00*

U.S. Cl. 179—110 A **6 Claims**



An electrostatic type, electroacoustic transducer having excellent acoustic characteristics is composed of an piezoelectric film of a polyvinylidene fluorine resin having an electroconductive material on the opposite surfaces of the film.

3,792,205

HAND HELD TELEPHONE TEST INSTRUMENT

Orrin B. O'Dea, Garden Grove, Calif., assignor to Communication Mfg. Co., Long Beach, Calif.

Filed June 1, 1971, Ser. No. 148,435

Int. Cl. H04m *3/22*

U.S. Cl. 179—175 **16 Claims**

A hand held telephone test instrument, which is in the general form of a telephone hand set and embodies circuit and

mechanical components for performing the usual hand set functions of dial, talk and monitor, but which utilizes such components in novel combination with additional circuit and mechanical components for selectively performing comprehensive functional tests on telephone switching equipment of both the dial and "Touch-Tone" types, which testing has conventionally required the use of a separate complete "-Touch-Tone" telephone as well as additional test sets which are complex, expensive and much too bulky to be carried by a telephone testman.

3,792,206

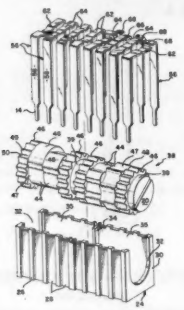
BINARY CODABLE, CAM OPERATED, PIVOTED CONTACT SWITCH ASSEMBLY

Harold Lawrence Purdy, Hummelstown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 13, 1972, Ser. No. 306,113

Int. Cl. H01h *19/62, 1/00*

U.S. Cl. 200—6 B **4 Claims**



This invention relates to a switch having four parts including the housing. More particularly the invention relates to a frame which has 16 positions which can be binary coded. The 16 positions consist of four single pole-double throw contacts all of which are made by stamping and forming a single sheet of metal. The movable contacts are switched from one fixed contact to another by lobes on a rotatable camshaft.

3,792,207

ELECTRIC MOTOR DRIVEN TIMING RELAY WITH COMPONENTS DISPOSED ON ONE SIDE OF SUPPORTING FRAME

Alois Muhling, Pleinfeld; Helmut Schmidt, and Hans Knie, both of Nurnberg, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

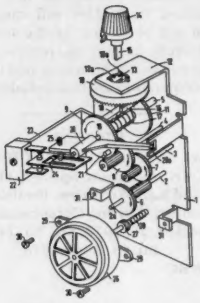
Filed Nov. 30, 1972, Ser. No. 310,879

Claims priority, application Germany, Dec. 4, 1971, 2160301

Int. Cl. H01h *43/10, 9/02*

U.S. Cl. 200—35 R **3 Claims**

An electric motor driven timing relay has a speed-reducing gear train having input and output gears and with all of its gears journaled on shafts fixed to a base plate, the electric motor driving the input gear when energized and the output gear having an element fixed on it which rotates with it through a circular path, an electric switch being provided with an actuator positioned in this rotative path and a setting wheel being provided which releasably connects with the output gear for moving the latter to any of a range of rotative positions from which to start its rotation when the motor is energized. To facilitate assembly of these various parts of the relay, the gear journaling shafts are fixed to the base plate to project from only one side of the base plate and the motor and its connecting means, the switch and its actuator, and the setting wheel are also all positioned on this same side. This permits all



of the relay parts to be assembled without reversing the base plate or working on its opposite sides, thus facilitating manual and particularly automated assembling operations.

3,792,208

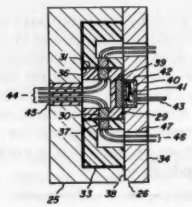
COMMUNICATIONS CONNECTOR APPARATUS UTILIZING RADIANT ENERGY

Bruce L. Meyer, Bloomington, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Nov. 15, 1972, Ser. No. 306,956

Int. Cl. H01r *13/70*

U.S. Cl. 200—51 R **14 Claims**



Connector apparatus for a communications link includes first and second mateable housings defining an interface region therebetween. A plurality of radiation emitting devices are supported by one of the housings and a like plurality of radiation responsive devices are supported by the other housing so that upon application of an electrical signal to a radiation emitting device, the radiation emitting device emits radiation across said interface region to impinge a corresponding radiation responsive device. The level of radiation is representative of the level of the applied electrical signal, and the electrical characteristics of the receiving radiation responsive device are representative of the level of incident radiation.

3,792,209

SWITCH SENSING DEVICE FOR SENSING PRESENCE OF SEAL ON CONTAINERS

Heinz Focke, Verden/Aller, Germany, assignor to Focke & Pfuhl, Verden/Aller, Germany

Filed Mar. 17, 1972, Ser. No. 235,771

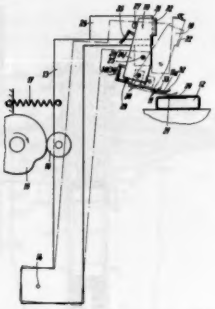
Claims priority, application Germany, Mar. 19, 1971, 2113316

Int. Cl. H01h *3/16*

U.S. Cl. 200—61.41 **18 Claims**

A device for checking containers for edges of closing parts when the edges are not covered by a covering strip such as a

tax stamp. A contact element including a contact finger is mounted on a support in a position where it will pass over the area to be covered by the covering strip. If the covering strip is



present the contact finger passes over the edge of the closing part. If, however, the covering strip is absent, the contact finger engages the exposed edge and the engagement causes the activation of an alarm.

3,792,210

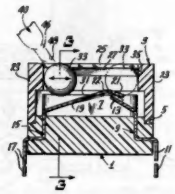
MICROMINIATURE SWITCH CONSTRUCTION

Orrin B. O'Dea, Garden Grove, and Thomas W. Hanneman, Fountain Valley, both of Calif., assignors to Jim C. Garrett, Long Beach; Robert H. Johnson, Marina Del Ray and Jack Shelton, Long Beach, all of, Calif.

Filed Aug. 11, 1972, Ser. No. 279,863

Int. Cl. H01h *3/16*

U.S. Cl. 200—61.59 **11 Claims**



A microminiature switch having a housing base and a housing cover, a pair of contacts in the base with a ball member held in place by the cover for closing the circuit. One contact is at least partially resilient, and has a movable portion overhanging a stationary contact. The ball member is moved by an exterior actuator over an apex of the movable contact to cam it into engagement with the stationary contact.

In another modification the ball bridges two contacts, rather than camming them together.

3,792,211

IMPACT FIRE SAFETY SWITCH

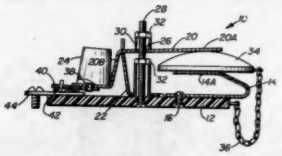
Jesse E. McGuffey, Rt. No. 1, Blue Ridge, Tex.

Filed Mar. 26, 1973, Ser. No. 344,572

Int. Cl. H01h *35/14*

U.S. Cl. 200—61.45 R **4 Claims**

An impact fire safety for use with an engine driven vehicle having a vehicle electrical system and an engine ingnition system, including switch means in the electrical system, each switch means having an actuated and a deactuated position



and means of deactuating both switch means on impact of the vehicle.

3,792,212

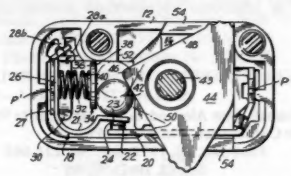
SNAP ACTION ELECTRIC SWITCH

Louis Ludwig, c/o Eagle Electric Mfg. Co. Inc., 23-10 Bridge Plaza S., Long Island City, N.Y.

Filed Aug. 17, 1971, Ser. No. 172,492

Int. Cl. H01h *21/40*

U.S. Cl. 200—68 **1 Claim**



A snap action electric switch including a ball movable between alternate switching positions by a cam for controlling switching conditions. A coiled compression spring presses against the ball in a direction perpendicular to the direction of movement of the ball between said switching positions to assist the cam in snapping said ball to its alternate switching positions and means is provided to permit the ball to move relative to the spring between said switching positions so as to prevent said coiled compression spring from laterally flexing as said ball is moved to its alternate positions.

3,792,213

HIGH-VOLTAGE CIRCUIT INTERRUPTER INCORPORATING SERIES VACUUM INTERRUPTER ELEMENTS

Richard E. Kane, Monroeville, Pa.; Frank L. Reese, deceased, late of Monroeville, Pa., and Blanche C. Reese, executrix, Lansford, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

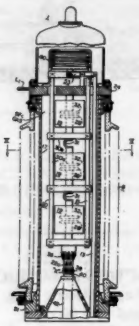
Filed Oct. 30, 1970, Ser. No. 85,512

Int. Cl. H01h *33/66*

U.S. Cl. 200—144 B **8 Claims**

A high-voltage circuit interrupter is provided utilizing a plurality of vacuum-type circuit interrupter elements located spatially in series, and having their respective movable contacts simultaneously opened and closed to interrupt and reconnect the connected circuit. The vacuum-interrupter elements are operated by a generally ladder-shaped movable contact assemblage, and the vacuum interrupter elements are preferably disposed in an atmosphere, or environment of a gaseous insulating medium, which is selected for its high dielectric strength to thereby increase the breakdown voltage axially along the units, or elements.

The construction is such that the several vacuum-interrupter elements may be collectively removed, as a unitary assemblage, from a surrounding insulating casing structure for maintenance purposes, when desired. For the lower ratings,

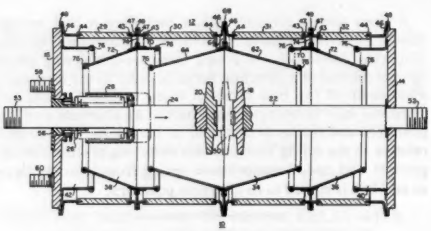


one of the interrupting columnar assemblages may be replaced by a terminal-bushing structure, instead of having a second columnar arc-extinguishing assemblage, involving a plurality of additional vacuum-type interrupting elements.

3,792,214
VACUUM INTERRUPTER FOR HIGH VOLTAGE APPLICATION

Roy E. Voshall, New Alexandria, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 28, 1972, Ser. No. 221,665
Int. Cl. H01h *33/66*
U.S. Cl. 200—144 B **5 Claims**



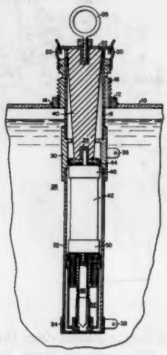
An improved shielding arrangement in a vacuum-type circuit interrupter for increasing the basic insulation level (BIL) and preventing the accumulation of a metallic coating on the internal insulating surfaces which can cause failure of the interrupter.

3,792,215
ELECTRICAL LOAD-BREAK APPARATUS

August I. Keto, Sharon, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 17, 1972, Ser. No. 254,266
Int. Cl. H01h *9/30, 33/00*
U.S. Cl. 200—144 C **10 Claims**

An electrical power disconnect device having an arc-quenching sleeve which extinguishes generated arcs. The sleeve is positioned around a conductor probe which is inserted into a contact structure to provide a current path. The probe is withdrawn from the contact structure to interrupt the current path and disconnect the load. During probe withdrawal, the sleeve slides along the probe and blocks the path of an arc between the probe and the contact structure.

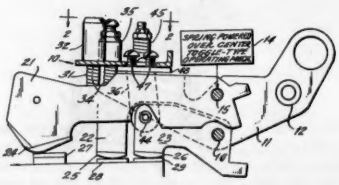


The arc-quenching sleeve is constructed on an insulating material which exhibits arc-extinghishing properties.

3,792,216
ANTI BLOW-OFF MEANS FOR CIRCUIT BREAKER CONTACTS

Carl E. Gryctko, Haddon Heights, N.J., assignor to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed July 27, 1972, Ser. No. 275,522
Int. Cl. H01h *33/12*
U.S. Cl. 200—146 R **7 Claims**



The movable contact structure of a very high current capacity molded case circuit breaker is provided with means to prevent blowoff forces from opening the arcing contact prior to opening movement of the contact carrier.

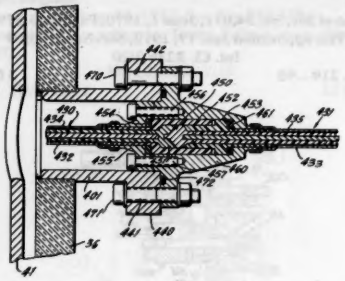
3,792,217
COAXIAL CONDUCTOR CONNECTOR AND GLAND FOR TWO-PRESSURE CIRCUIT BREAKER

Lorne D. McConnell, Chalfont, Pa., and Rolf Mockli, Moillesulaz, Switzerland, assignors to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed May 25, 1972, Ser. No. 256,932
Int. Cl. H01h *33/59*
U.S. Cl. 200—148 B **12 Claims**

A coaxial conductor connector for allowing connection from a low pressure ambient to the high pressure interior of a circuit breaker operated in response to connection of high

voltage, high current pulses to our impulse coil in the high-pressure interior of the breaker. The gland permits easy connection and disconnection of the coaxial cable and maintains a pressure seal of the circuit breaker housing when the cable is connected.



3,792,218

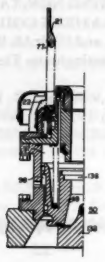
GAS OPERATED BLAST VALVE FOR DOUBLE-FLOW INTERRUPTERS

Charles F. Cromer, Trafford; Kue Hong Yoon, Pittsburgh, and Hayes O. Dakin, Jr., Irwin, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 7, 1972, Ser. No. 269,691

Int. Cl. H01h *33/54*

U.S. Cl. 200—148 B **9 Claims**



A compressed gas circuit interrupter of the dual pressure type in which one or more pair of contacts are separated in a high pressure gaseous environment, and the high pressure gas exhausts through both of the separable contacts. For each pair of contacts the continued exhaust of gas through the contacts is controlled by a mechanically operated main blast valve and a gas operated auxiliary blast valve. The auxiliary blast valve works in conjunction with the main blast valve and utilizes primarily the internal gas pressure for its operating power and control.

3,792,219

PUSHBUTTON SWITCH WITH COIL SPRING MOVABLE CONTENT WEDGINGLY ENGAGEABLE WITH STATIONARY HOUSING CONTACT

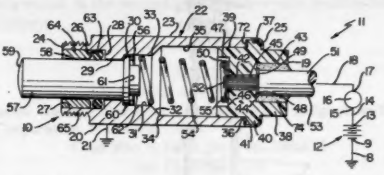
Paul M. Rowley, Bexley, Ohio, assignor to Robertshaw Controls Company, Richmond, Va.

Filed June 30, 1972, Ser. No. 267,891

Int. Cl. H01h *13/52, 1/18*

U.S. Cl. 200—159 R **20 Claims**

An electrical switch construction having a housing and a movable plunger carried by the housing. A compression spring is carried by the housing and is engageable with the plunger, the spring when in one operative position being in wedged relation with the housing to provide an electrical circuit through the spring to the housing at the wedging engagement therebetween. The spring, housing and plunger are so constructed and arranged that when the plunger is moved to a certain position relative to the housing, the spring is moved out of its wedging relation with the housing to break the electrical circuit therethrough.



3,792,220

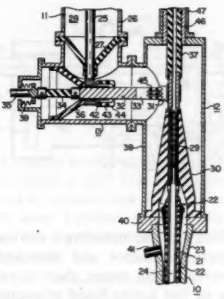
DEVICE FOR CONNECTING EXTREME LOW TEMPERATURE CABLE WITH NORMAL TEMPERATURE ELECTRIC APPARATUS

Yoshio Yoshioka, and Kenichi Okuyama, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sept. 19, 1972, Ser. No. 290,356

Int. Cl. H01h *31/32*; H02g *15/22*

U.S. Cl. 200—163 **9 Claims**



A disconnecting switch is provided in the connecting part between a cable kept at extremely low temperature by means of extremely low temperature coolant and an electric apparatus kept at normal room temperature such as a gas-filled duct transmission line, transformer etc., which disconnecting switch is opened when current is interrupted. And the disconnecting switch is housed in a vacuum casing.

3,792,221

DISCONNECT SWITCH

Felix Paal, Niederkaufungen, Germany, assignor to Licentia Patent-Verwaltungs G.m.b.H., Frankfurt am Main, Germany

Filed Apr. 3, 1972, Ser. No. 240,624

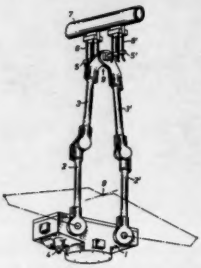
Claims priority, application Germany, Apr. 1, 1971, 2115901; Apr. 1, 1971, 7112539

Int. Cl. H01h *31/00*

U.S. Cl. 200—48 V **6 Claims**

An improved electrical disconnect switch of the scissors type whose counter contact is fastened to a rigid current rail.

The counter contact is formed by at least one pair of spaced vertically extending resilient finger-type contacts and the contact for the scissors mechanism is formed by a horizontally



disposed contact bolt which is rigidly fastened to one of the arms of the scissors-type switch at the upper scissors joint thereof and extends from at least one side of the upper scissors joint in a direction parallel to the pivot axis of the joint.

3,792,222

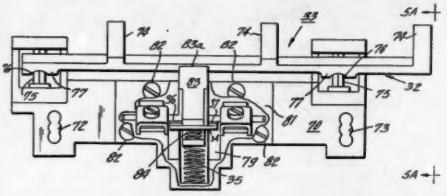
ANTI-SINGLE PHASING DEVICE

Keith Theophil Krueger, Bellefontaine, Ohio, assignor to ITE Imperial Corporation, Philadelphia, Pa.

Filed May 8, 1972, Ser. No. 251,288

Int. Cl. H01h *3/20, 85/00*

U.S. Cl. 200—169 R **5 Claims**



A motor controlling system, including a conventional multipole electromagnetic contactor and associated overload relay means, is provided with motor short circuit protector means in the form of fast acting fused protector units connected in series with the heaters of the overload relay means and the motor windings. Under relatively low fault current conditions, the overload relay means opens the contactor actuating coil circuit, and under severe fault conditions the fused protector units become active to open the energizing circuit for the holding coil of the electromagnet.

At currents in excess of 5.5 to 6.5 times full load motor current, this being the locked rotor current for most motors, the fused protector unit blows faster than the overload relay trips, thereby protecting the branch wire contactor and the overload relay means. Actuation of a fused protector unit causes an ejector pin thereof to operate a common trip bar which, in turn, opens a switch in the coil circuit. This trip bar is part of an anti-single phasing unit that is selectively positionable with respect to the clips which mount the fused protector units, thereby cooperating with fused protector units of different sizes. These clips are provided with integral formations which serve a blocking or non-interchangeability function, thereby preventing oversized fused protector units from being mounted to the clips. The antisingle phasing unit and protector unit holding clips are mounted on one surface of a relatively shallow molded housing having disconnect switch means mounted therein.

3,792,223

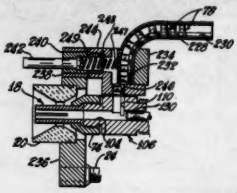
STUD WELDING TOOL AND STUD LOADING DEVICE THEREFOR

Steve Spisak, Elyria, Ohio, assignor to TRW Inc., Cleveland, Ohio

Division of Ser. No. 54,071, June 1, 1970, Pat. No. 3,679,860. This application Jan. 17, 1972, Ser. No. 218,609

Int. Cl. B23k *9/20*

U.S. Cl. 219—98 **3 Claims**



A stud welding tool including a loading device for increasing feed rate of studs into the tool chuck. The loading device is positioned behind the chuck and includes a plunger which feeds the studs to a welding position from a supply magazine adjacent the tool. The studs are positioned for feeding by the loading device in response to engagement of the stud welding tool with the workpiece with each stud being fed for positioning by the plunger prior to the welding operation.

3,792,224

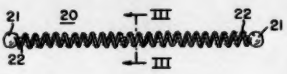
METHOD FOR MAKING NON-TANGLING BEADED FILAMENT COILS

James Petro, Little Falls, and Clair M. Rively, Old Bridge, both of N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 792,988, Jan. 22, 1969, abandoned. This application July 19, 1971, Ser. No. 163,651

Int. Cl. B23k *27/00*

U.S. Cl. 219—121 LM **6 Claims**



The tangling of hellically-coiled wire articles during bulk handling and shipment is prevented by providing integral modules or beads of fused metal at each end of the articles which enclose the severed ends of the wire. In the case of tungsten wire coils that are designed for use in electric lamps and similar devices and are wound on iron mandrels, the fused beads are composed of tungsten-iron alloy and formed in situ during coil manufacture by melting the ends of the mandrel with a concentrated heat source such as a focused laser beam. The tungsten-iron alloy beads remain on the end turns of the coil during the subsequent mandrel-dissolving operation, are ductile and are formed without embrittling the tungsten wire.

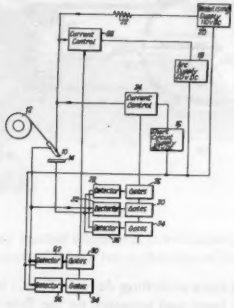
Various methods and an apparatus for manufacturing such beaded-end coils on a mass production basis using a CO_2 laser are disclosed.

Since the beads can readily be made larger than the diameter of the coil and be spaced a predetermined distance apart, they provide built-in guides or "reference points" for mounting incandescent lamp type filament coils on their lead wires and thus accurately controlling the lighted-length of the mounted coils.

3,792,225
WELDING POWER SOURCE

James C. Needham, Saffron, and Peter Boughton, Balsham, both of England, assignors to The Welding Institute, Cambridge, England

Filed Aug. 24, 1972, Ser. No. 283,378
Claims priority, application Great Britain, Aug. 24, 1971, 39695/71
Int. Cl. B23k *9/10*
U.S. Cl. 219—131 R **15 Claims**

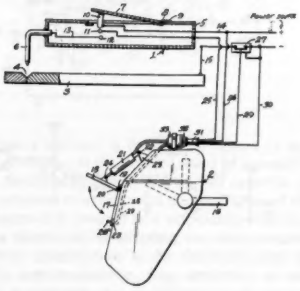


Metal arc welding apparatus, primarily intended for short-circuit welding, including a first D.C. power supply for maintaining an arc between a consumable electrode and a workpiece and a control circuit responsive to a short-circuit detector for coupling a second D.C. power supply, substantially without inductance, to the welding circuit after a delay. Preferably a further detector senses the impending rupture of the short-circuit and the control circuit acts to reduce the current before the rupture takes place.

3,792,226
EYE PROTECTOR FOR WELDERS

Clarence C. Bush, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Substitute for Ser. No. 103,975, Jan. 5, 1971, abandoned. This application Aug. 29, 1972, Ser. No. 284,534
Int. Cl. B23k *9/32*
U.S. Cl. 219—147 **3 Claims**

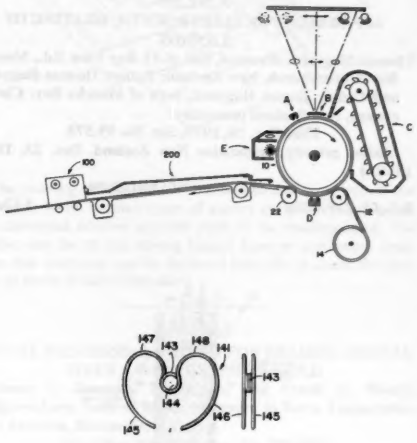


A fail-safe eye protector for welders consisting of a spring loaded, darkened window-hinged over a clear glass window on a welder's hood and an electrode hand holder having a spring loaded grip switch bridging a pair of contacts when fully closed. One contact is in circuitry with a solenoid mounted on the hood while a second circuit connects a micro-limit switch, operated by the darkened window, to the other contact. When the grip switch is pressed to the first contact the solenoid closes the darkened window and when pressed fully closed it bridges both contacts to strike the arc. Full release of the grip switch breaks both circuits and the darkened window opens. A safety switch in the secondary circuit prevents malfunction of the system.

3,792,227
FUSER APPARATUS

Charles Howard Snowden, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 5, 1972, Ser. No. 250,671
Int. Cl. H05b *1/00*
U.S. Cl. 219—216 **8 Claims**

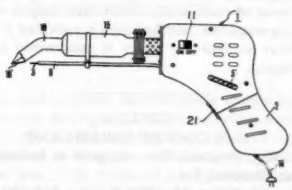


Support for a lamp used in a fuser apparatus in which the terminal of the lamp is held in a convoluted central portion and is supported by arcuate legs. An electrical connector is attached to the lamp terminal through aligned apertures in spaced arms of the connector which are compressed toward each other by a screw.

3,792,228
ELECTRIC SOLDERING IRON

Kuo Wei-Cheng, 48 Pa-Teh Road Section 1, Taipei, China /Taiwan

Filed Sept. 20, 1972, Ser. No. 290,646
Int. Cl. H05b *1/00*; **B23k** *3/06*
U.S. Cl. 219—230 **8 Claims**



The soldering iron has a grip with a recess rotatably receiving a roll of wound wire-solder. A guide means extends from

the grip toward the point of a heated soldering tip, for receiving the wire solder and guiding it toward the soldering tip. A pair of rotatable interfitting gears have facing and mating annular grooves therein through which the wire-solder passes and as the gears are rotated the solder is fed toward the soldering tip. One of the two gears may be driven by an electric motor in the grip, upon operation of a suitable switch, and the other is spring biased toward the one gear to firmly grip the wire-solder. A manual operator, in the form of a disc having a perforated periphery, is secured to the gear normally driven by the motor and this periphery extends through a slot or opening in a wall of the grip. Wire-solder can be delivered automatically or manually to the pointed head of the tip of the heater through the wire-delivery pipe by closing the motor switch or rotating the periphery of the disk with a finger tip, and the soldering can be conducted easily with one hand.

3,792,229

APPARATUS FOR ELECTROLYTIC HEATING OF LIQUIDS

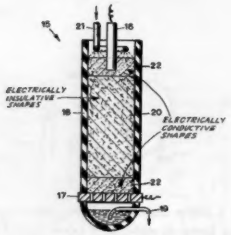
Thomas Hagyard, deceased, late of 61 Bay View Rd., Moncks Bay, Christchurch, New Zealand; Robert Thomas Hagyard, and Cedric Jaques Hagyard, both of Moncks Bay, Christchurch, New Zealand (executors)

Filed Dec. 18, 1970, Ser. No. 99,578

Claims priority, application New Zealand, Dec. 23, 1969, 158834

Int. Cl. H05b *3/60;* **B01j** *9/00*

U.S. Cl. 219—284 **5 Claims**



An apparatus for electrolytic heating of corrosive and other electrically conductive liquids comprises a plurality of electrically insulating shapes, such as stoneware Raschig rings, disposed between two or more electrodes. The insulating shapes are packed within a non-conductive tower and means are provided for irrigating the shapes with the liquid to be heated so that the liquid flows in a relatively thin film over the insulating shapes to provide a conductive path between the electrodes. The effective surface area of the electrodes is increased by placing between each electrode and the insulating shapes a mass of electrically conductive shapes, such as carbon Raschig rings. An overflow pipe is provided at the bottom of the tower so that the tower is maintained substantially empty of liquid.

3,792,230

GAS-COOLED TORCH LAMP

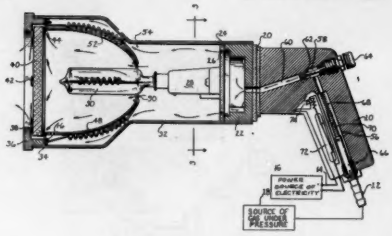
Jimmy C. Ray, Denison, Tex., assignor to Industrial Innovations Inc., Denison, Tex.

Filed Mar. 30, 1972, Ser. No. 239,692

Int. Cl. H05b *1/02, 3/00;* **F21v** *29/00*

U.S. Cl. 219—343 **3 Claims**

An infrared heating device includes a pistol grip handle carrying a lamp and a reflector spaced therefrom for focusing infrared radiation upon work to be heated. A filter is positioned over the front of the reflector for passing only infrared radiation to the work. Means are provided to establish a flow of cooling gas over the exterior and interior of the reflector and over in inner and outer faces of the filter. A flow-responsive switch is provided in the handle for detecting the flow of cooling gas. A solid state switching device (Triac) is connected in circuit with the lamp and actuated by the flow-responsive for energizing the lamp only when a flow of cooling gas is established.



3,792,231

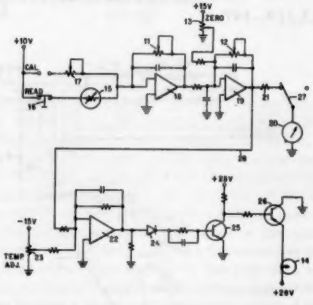
MINIATURE MULTISTATION PHOTOMETER ROTOR TEMPERATURE CONTROL

Wayne F. Johnson, Loudon, Tenn., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Jan. 11, 1973, Ser. No. 322,645

Int. Cl. H05b *1/02*

U.S. Cl. 219—497 **3 Claims**



A rotor temperature monitoring and control circuit for a Miniature Fast Analyzer is provided. Radiant heat from a heat lamp is directed onto the rotor and, by means of a thermistor positioned in the rotor, closed-loop control of the rotor temperature is achieved. Temperatures within ±0.2 degree centigrade can be maintained at the cuvettes of the rotor.

3,792,232

ELECTRICALLY HEATED WINDOW

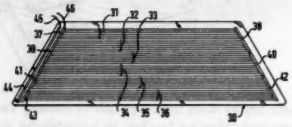
Alex Zarenko, Brand near Aachen, Germany, assignor to Saint-Gobain Industries Vector Hugo, Neuilly-sur-Seine, France

Filed Sept. 27, 1972, Ser. No. 292,807

Claims priority, application Germany, Sept. 28, 1971, 2148243

Int. Cl. H05b 3/06

U.S. Cl. 219—522 2 Claims



A heavy-duty heated window is constructed with a series of heating units each of which has a plurality of heating elements in parallel.

3,792,233

HEATING ELEMENT

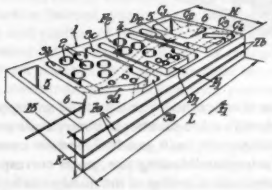
Ann-Marie Anthony, Bellevue; Krzysztof Dembinski, Tige, and Lucien Dupont, Vouzon, all of France, assignors to Agence Nationale De Valorisation De La Recherche (AHVAR), Paris, France

Filed May 17, 1972, Ser. No. 254,034

Claims priority, application France, May 19, 1971, 71.18236

Int. Cl. H05b 3/10

U.S. Cl. 219—553 14 Claims



The heating element is formed of refractory material resistant to oxidation, in the general shape of a parallelepiped. It has, in a direction perpendicular to two opposite surfaces, a nonhomogeneous structure such that when one of the two surfaces concerned is brought to a sufficiently high temperature to become electrically conducting, the other remains at a sufficiently low temperature to be thermally and electrically practically non-conducting. The structure is adapted to withstand movements due to differences in expansion. The element is made either of entirely or partially stabilized zirconia or of a definite compound of the pyrochlore type based on zirconia, of the formula $Zr_2T_2O_5$, T being a metal, especially a rare earth. It has holes and cut-outs formed in the mass of the element in a direction substantially perpendicular to that which unites said two opposite surfaces. The ratio hollow/solid is within a range of about 0.1 to 3.

3,792,234

METHOD AND APPARATUS FOR READING INFORMATION CARRIERS ON A MOVING ARTICLE

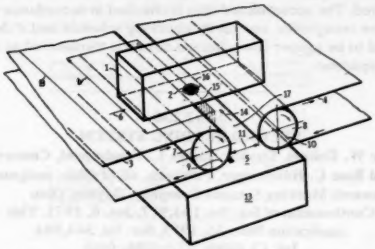
Jakob Sturzenegger, Wolfhausen, Switzerland, assignor to Zellweger Ltd., Uster, Switzerland

Filed Sept. 30, 1971, Ser. No. 185,097

Claims priority, application Switzerland, Oct. 21, 1970, 15598/70

Int. Cl. G06k 7/14, 7/015

U.S. Cl. 235—61.11 E 6 Claims



The reading unit is sized to read only over a portion of the conveyor while various types of guides are provided to guide the conveyed articles into the path of the reading zone. The guides can be of the spring biased type or stationary type. Also, the conveyor can be inclined laterally to cause the articles to move to the lower side.

3,792,235

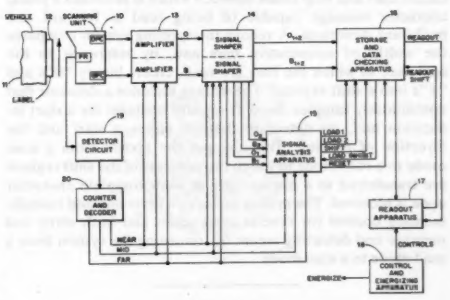
SIGNAL PROCESSING SYSTEM FOR READING INDICIA OVER A WIDE DEPTH OF FIELD

Anthony C. Durante, Burlington, and Frank G. Macey, Shrewsbury, both of Mass., assignors to Servo Corporation of America, Hicksville, N.Y.

Filed Dec. 22, 1971, Ser. No. 210,869

Int. Cl. G06k 7/00, 7/10

U.S. Cl. 235—61.11 E 5 Claims



Automatic coded object identification system for reading labels of the type having retroreflective stripes arranged in a vertical array over a wide depth of field to two or more ranges (specifically three in the embodiment described herein). For each vertical scan of the stripes of a lebel by a scanner a set of electrical signals are produced. Each vertical scan also causes one of three processing control signals to be produced in succession. The electrical signals are amplified, shaped, and analyzed to determine if they meet prescribed limits as to pulse-width measurements for proper label-derived signals.

The process control signals control the values of amplification, shaping, and pulse-width measurement limits so that during three successive scans three sets of signals from a label are processed in three different manners. Each of the three process control signals causes the apparatus to optimally process the signals for a label located within a corresponding one of the three ranges. Thus, if a label is within one of the three ranges, the signals produced during one of three scanning operations will be properly processed. When signals are properly processed and found to meet the prescribed limits of pulse-width and other timing criteria, they are stored in a shift register until all the signal data on the label is accumulated. The accumulated data is checked in accordance with pattern recognition and parity checking schemes and if determined to be proper label-derived data it is transmitted to read out apparatus.

3,792,236

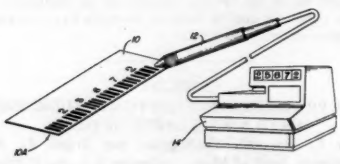
RECORD READING SYSTEM

Bruce W. Dobras, Dayton; James L. Vanderpool, Centerville, and Ross C. Humbarger, Fairborn, all of Ohio, assignors to Monarch Marking Systems Company, Dayton, Ohio

Continuation of Ser. No. 104,977, Jan. 8, 1971. This application Mar. 26, 1973, Ser. No. 344,994

Int. Cl. G06k *7/14*; **G08c** *9/06*

U.S. Cl. 235—61.11 E **16 Claims**



A machine-readable record or label includes alternating areas or bars of different reflectivity whose relative widths are varied to provide a binary coded data record. The record includes start and stop codes between which is recorded a plural character message capable of being read in forward and backward directions. A record interpreting system compares the widths of consecutive bars and, by reference to the sequence in which the bars are read, enters binary "0"s and "1"s into a shift register. The system includes a detector that continuously samples the shift register contents for a start indication and, on detection thereof, stores a start and the direction of reading. This changes the system from a scan mode to a read mode in which the contents of the shift register are transferred to a display only as each complete character code is received. The system includes a reversing and complementing control for reverse read codes and both error and message end detecting means for returning the system from a read mode to a scan mode.

3,792,237

EMBOSSED CARD ORIENTATION DEVICE

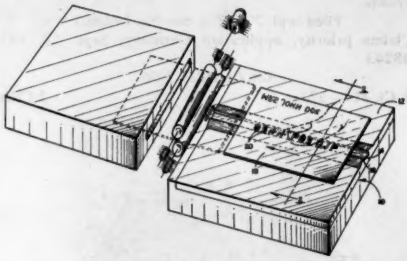
Gust A. Olson, Los Angeles, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 13, 1971, Ser. No. 207,093

Int. Cl. G06k *7/015, 19/06, 13/06*

U.S. Cl. 235—61.11 R **3 Claims**

This invention discloses a device for orienting credit cards insuring the embossed account numbers of the credit card will be entering the character scanning apparatus in correct attitude. The orientation device has a top member with a substantially flat surface formed with an accurately dimensioned groove to receive a row of embossed characters on a credit card. The raised portion of the groove tapers at an angle of



about ten degrees to the top surface permitting easy lateral sliding of the character row substantially free of interference with adjacent character rows of the credit card.

3,792,238

PROCESS FOR REGISTERING IN BINARY CODE AND FOR READING AN IDENTIFICATION NUMBER ON A METALLIC PIECE

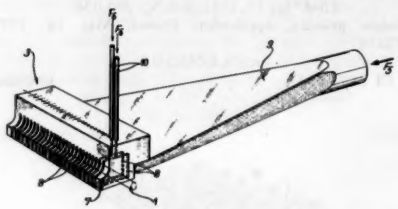
Alain Jean Samoel, Manosque, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed Aug. 7, 1972, Ser. No. 278,386

Claims priority, application France, Aug. 6, 1971, 7128851

Int. Cl. G06k *1/12*

U.S. Cl. 235—61.11 J **4 Claims**



The invention is concerned with a method and apparatus for recording an identification number in binary code and reading it on a metal component such as a fuel element canning tube. A number of microsandblasting jets, each corresponding to one of the binary code numbers of the number to be recorded, are directed to different portions of the component and each jet is deflected before its arrival depending upon whether it corresponds to the number 1 or the number 0. The component is subjected to a reading operation using beams of light.

3,792,239

DEVICE FOR TRANSMITTING WAVELENGTHS OF THE ELECTROMAGNETIC SPECTRUM

Ronald L. Ohlhaber, Evanston, and Donald A. Pontarelli, Chicago, both of Ill., assignors to Northern Illinois Gas Company, Aurora, Ill.

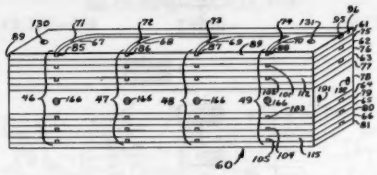
Filed Dec. 30, 1971, Ser. No. 214,267

Int. Cl. G02b *5/14*; **G06k** *7/10*

U.S. Cl. 235—61.12 N **9 Claims**

A device for transmitting wavelengths of the electromagnetic spectrum from one or more sources to detector means, comprising one or more channel plates each having channels therein into which are disposed conduction elements of a

material having a higher index of refraction than the material of the associated plates. The channels and associated conduction elements selectively intersect exterior surfaces of the channel plates such that wavelengths from sources positioned



generally adjacent selected end portions of the conduction elements are guided to the opposite ends of the channels. The device finds application in optical encoder systems, card and punched tape illuminators and readers, and alphanumeric devices and the like.

3,792,240

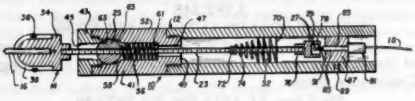
PROBE AND MARKER ASSEMBLY

Gregory G. Stumpo, 5516 W. Higgins Rd., Chicago, Ill.

Filed June 26, 1972, Ser. No. 266,136

Int. Cl. G06m *11/00*

U.S. Cl. 235—92 PC **5 Claims**



An assembly adapted to mark a surface to be examined and adapted to cause a counter to be advanced when a mark is made on the surface, includes a rod extending at least partially within a tubular housing in axial alignment therewith and rockably mounted intermediate its ends near the front end of the housing, a marking device connected to the front end of the rod and extending from the front end of the housing, a first electrical contact fixedly mounted within the housing near the rear end portion thereof, a second electrical contact mounted on the rear end portion of the rod in axial alignment with the housing spaced from the first contact to engage it when the marking device engages the surface to cause the rod to rock, a coil spring surrounding the intermediate portion of the rod near its rear end portion spaced rearwardly from its rockable connection with the housing to urge the rod resiliently into axial alignment with the housing, the spring having a cylindrical helical portion engaging the inner surface of the housing substantially throughout the length of the helical portion and having an end portion attached to the rod, and first and second electrical connectors for supplying an electrical advance signal to the counter for advancing it, the first conductor being connected electrically to the housing and the second connector being electrically connected to the second contact, the rod, the housing, and the rockable connection being electrically conductive and the rod being connected electrically to the second contact.

3,792,241

COUNTER CONTROL CIRCUIT

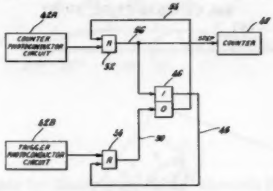
James Florence Sullivan, New Fairfield, Conn., assignor to Jovil Manufacturing Co., Inc., Danbury, Conn.

Filed Feb. 3, 1972, Ser. No. 223,100

Int. Cl. B65h *81/02*

U.S. Cl. 235—92 CW **5 Claims**

This invention provides a device for controlling the stepping of a counter counting the passage of an object or objects through a selected point. The device includes a pair of detectors, one for detecting the passage of an object through the selected point and one for detecting the passage of the object through a second or trigger point situated prior to said selected point in the path of travel of the object. A bistable device is set to its first state in response to an output from the second point detector when the device is in its second state. The bistable device is reset to its second state and the counter stepped in response to an output from the selected point detector if, at the time the output is generated, the bistable



device is in its first state. Thus, once the counter is stepped, it cannot be stepped again until the object again passes through the trigger point. The generation of spurious count pulses is thus surpressed. For a preferred embodiment, the device is being used in coil winding machine to control the counting of multiple wire turns wound on the coil, and the selected and second points are spaced by a distance greater than the maximum distance between wires to assure that the counter is stepped just once for each turn regardless of the number of wires being wound.

3,792,242

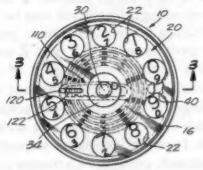
POCKET SIZE MANUAL ADDING MACHINE

Goodwin F. Hanson, 11520 S. Prairie, Hawthorne, Calif.

Filed Jan. 2, 1973, Ser. No. 320,098

Int. Cl. G06c *27/00*

U.S. Cl. 235—117 A **14 Claims**



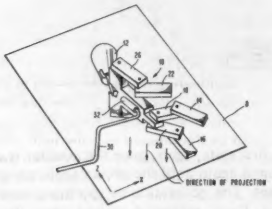
A small pocket size, manually actuatable adding machine. The machine is circular, of a size to be held in the hand. It is operated by a dial or rotor having ten equally spaced finger holes. It comprises counter wheels overlying each other and stators between the counter wheels. The manual rotor or dial carries a radially movable catch member which can be positioned to engage the periphery of individual counter wheels whereby the rotor can cause any individual wheel to be rotated any predetermined part of a revolution corresponding to a digit to be entered. A unique transfer means comprising stator members between adjacent wheels and a pawl carried by each rotor is provided whereby upon a full revolution of an

individual wheel, a step movement is imparted to an adjaecent wheel.

3,792,243
METHOD FOR ENCODING POSITIONS OF MECHANISMS

Arthur Appel, Yorktown Heights, and Arthur J. Stein, Peekskill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1971, Ser. No. 214,142
Int. Cl. G03b *15/06, 29/00*
U.S. Cl. 235—151 **10 Claims**



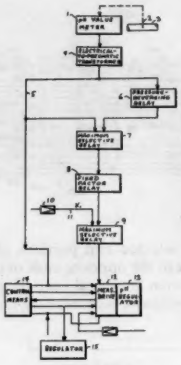
There is disclosed herein a method of digitizing two or three dimensional mechanisms in varied positions. If the object to be encoded is a fixed model, then such model in its fixed position is encoded. If the object is a movable mechanism, then the mechanism can be encoded in several positions whereby there can be provided a set of the mechanism's motions. The method includes the steps of providing a plurality of coordinates pickup points on the object or mechanism to be encoded. These points are sensed in Cartesian coordinates orientation, using a capacitance tablet, for example, to provide the Cartesian coordinates information for each of the sensed points. The Cartesian coordinates information is suitably provided to a digital computer interactive graphics device combination wherein, utilizing the Cartesian coordinate points information of the sensed points, a displayable projection of the object or mechanism can be calculated and such projection can be displayed on the screen of the interactive graphics device. Where it is desired to encode a three-dimensional mechanism, the encoding information can be obtained in perpendicular capacitance tablet planes or in poses displaced by 90° to enable the providing of X, Y and Z coordinates information. In addition, if the mechanism is of a movable type, then it can be encoded in different positions and, in the computer, the encodings for these different positions can be extrapolated to enable the calculations of a series of displayable projections which form an animated sequence. The projections can be calculated, using the Cartesian coordinates information, to provide either two- or three-dimensional projections.

3,792,244
CIRCUIT FOR PH VALUE REGULATION

Karl Wilke, Do-Aplerbeck, Germany, assignor to Fridrich Uhde GmbH, Dortmund, Germany

Filed June 2, 1972, Ser. No. 259,150
Int. Cl. G06f *15/46*
U.S. Cl. 235—151.3 **4 Claims**

Regulation of pH value of solutions along a titration curve. The pH value is measured to obtain a linear signal which is conveyed in inverted form in one path and non-inverted form in another path to a means for selecting its output from the

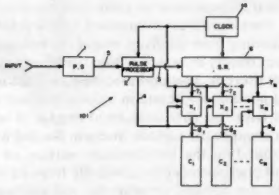


path having the maximum value. This output is stretched, clipped and used to drive a pH regulator in a hyperbolic manner.

3,792,245
DOUBLE-SCALED AUTOCORRELATOR

Lon Hocker, Newton, and Irl W. Smith, Jr., Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 21, 1972, Ser. No. 282,649
Int. Cl. G06f *15/34*; **G06g** *7/19*
U.S. Cl. 235—181 **13 Claims**



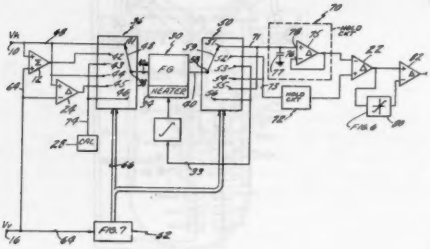
A double-scaled autocorrelator which includes means for eliminating spurious correlations which occur in the system because of the double scaling. The autocorrelator system includes a pulse shaper to receive an incoming signal. In one system, the pulse shaper is connected to a pulse processor comprising a single presettable scaler which is preset each clock period by a random court generator, thereby removing spurious correlations. In another system, the pulse shaper is connected to a pulse processor comprising two phase-independent scalers to perform that function. The system contains a shift register connected to receive as one input the output of the scaler (or the first of the two scalers), the output of each unit of the shift register being connected as an input to a clocked multiplier another input to which is derived from the scaler (or the second of the two scalers). The system further includes a plurality of counters, each to receive as an input an output from one of the multipliers. Furthermore, the system may include provision to subtract from each counter the input to the last counter, and it may include provision for clocking the channels at successively slower rates.

3,792,246

VECTOR ANGLE COMPUTER

Dennis R. Gilbreath, Seymour, Conn., and Sheldon D. Kralstein, Forest Hills, N.Y., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Nov. 10, 1972, Ser. No. 305,635
Int. Cl. G06g 7/22, 7/26, 7/78
U.S. Cl. 235—186 6 Claims



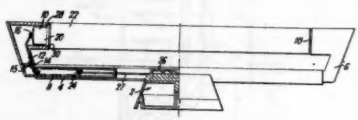
An output voltage proportional to the angle of a vector is provided by apparatus including a logarithmic function generator. The output voltage is proportional to the difference between the logarithm of one of two orthogonal components of the vector and the logarithm of the sum of the components. A nonlinear network may be used for providing a correction signal to correct a known deviation of the output voltage. A calibration voltage is periodically applied to the input of the function generator which, in response thereto, provides an error voltage which is fed to an integrator which drives a heater included as an integral part of the function generator, resulting in changes of the temperature of the function generator to change its transfer characteristics in a manner tending to reduce the error voltage to zero.

3,792,247

TUBULAR LAMP FITTINGS

Victor Frederick Beuttell, Malmesbury, England, assignor to Linolite Limited, Wiltshire, England

Filed Sept. 13, 1971, Ser. No. 179,654
Claims priority, application Great Britain, Sept. 22, 1970, 45,096/70
Int. Cl. H05b 33/02
U.S. Cl. 240—51.11 R 4 Claims



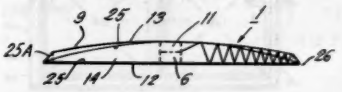
A lighting fitting to accommodate tubular electric filament lamps of alternative lengths. The lamp holders are mounted at the end of inwardly biased telescopic arms. The holders comprise a socket in which is mounted a resilient contact which is less stiff than the inward bias of the holders so that the different lengths of end caps of different tubular lamps are completely covered by the sockets. The arms are biased by means of electrically conducting springs which connect the contacts in the holders to terminals.

3,792,248

MEANS FOR CONTROLLING ILLUMINATION OF CONTROL OR SERVICE ELEMENTS ON MOTOR VEHICLE

Gunter Dietz, Wuppertal-Barmen, Germany, assignor to GEBR Happich GmbH, Wuppertal-Elberfeld, Germany

Filed Aug. 1, 1972, Ser. No. 276,903
Claims priority, application Germany, Sept. 7, 1971, P 21 44 588.5
Int. Cl. F21 ; B60q 3/04
U.S. Cl. 240—1 EL 11 Claims



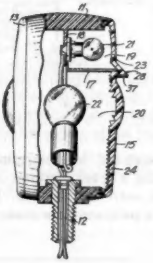
A light guide for illuminating display elements in a vehicle, which elements are on the dashboard, or the like; the guide comprises a light source, and a light guide positioned over both the elements to be illuminated and the light source; the light guide has an exterior surface which is spaced away from the elements being illuminated and which curves gradually toward the surface to be illuminated along the direction away from the light source thereby to concentrate light in the light guide body remote from the source; in certain embodiments, a prismatically shaped light guiding body intersects the principal light guide for concentrating light at a particular display element.

3,792,249

SIGNAL LAMP AND LENS

Kenneth J. Scowen, Springfield, N.J., and Elliott Goldbaum, Brooklyn, N.Y., assignors to Signal-Stat Corporation, Brooklyn, N.Y.

Filed Dec. 27, 1972, Ser. No. 318,953
Int. Cl. F21q 1/00
U.S. Cl. 240—106.1 10 Claims

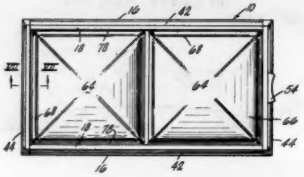


A signal lamp for providing a plurality of signals, constructed with more than one independently illuminated compartment, having a single lens covering the compartments, wherein light from one signal compartment is prevented from being transmitted within the lens material and falsely illuminating the portion of the lens covering a second compartment. By means of an optical light trap located in the lens at the intersection of the lamp compartments, the piping of light through the lens is prevented. The invention is also concerned with the lens construction.

3,792,250
LIGHT FIXTURE WITH REMOVABLE LENS

Eugene L. Kilbourn, and James T. Baker, both of Marshall, Mich., assignors to Progressive Dynamics, Inc., Marshall, Mich.

Filed May 5, 1970, Ser. No. 34,792
Int. Cl. B60q 3/02
U.S. Cl. 240—7.1 **3 Claims**

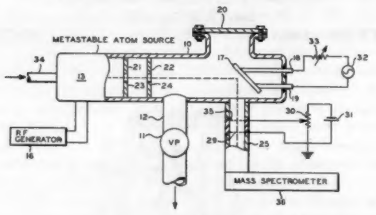


A surface mounted light fixture particularly suitable for use with recreational vehicles and watercraft wherein the fixture includes an extruded body member having end caps affixed to the body member ends. The body member is of a concave configuration receiving electrical lamps, and the lateral edge regions of the body member include lens retaining grooves for retaining a lens or lenses disposed over the body member. The lens is of a rectangular configuration, including transversely disposed base and wall regions, and is so shaped that the lens may be manually deformed for readily assemblying and disassemblying the lens to the body member for lamp replacement or cleaning.

3,792,251
SURFACE ANALYSIS

Thomas W. Schmidt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 8, 1971, Ser. No. 132,413
Int. Cl. B01d 59/44
U.S. Cl. 250—41.3 **4 Claims**



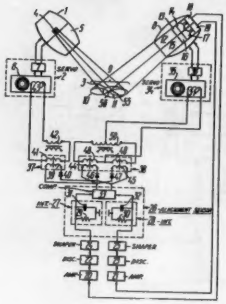
Surfaces are analyzed to determine materials adsorbed thereon by directing a beam of atoms or molecules excited to metastable levels onto the surface. Ions of the adsorbed material which are produced are analyzed, such as by a mass spectrometer.

3,792,252
APPARATUS FOR DETERMINING THE LEVEL AND PROFILE OF A MATERIAL

Vadim Nikolaevich Afanasiev, Bolotnikovskaya ulitsa, 40, korpus 4, kv. 23; Vladimir Olegovich Gaiduchik, Mariupolskaya ulitsa, 4, kv. 47, and Pavel Lukich Gruzin, ploschad Pryamikova, 6, kv. 21, all of Moscow, U.S.S.R.

Filed Nov. 23, 1970, Ser. No. 91,631
Int. Cl. G01n 23/10
U.S. Cl. 250—43.5 FL **2 Claims**

An apparatus for determining the level and profile of materials, in which a collimated radiation source has a servo and produces a beam of hard electromagnetic radiation reflected from an irradiated zone on a surface being gauged and picked up from a receiving zone by a collimated detector also having a servo. The two servos are controlled by individual amplifiers in accordance with signals received from an electrically connected means for sensing relative alignment

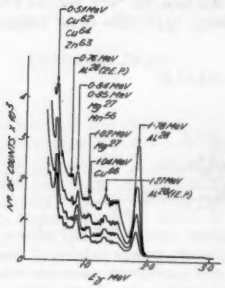


between the irradiated and receiving zones, one amplifier accepting signals corresponding to the amount of misalignment between the two zones with only one sign, according to the magnitude of which it brings down the speed of the associated controlled servo, and the other amplifier accepting signals corresponding to the amount of misalignment between the two zones.

3,792,253
METHOD AND APPARATUS FOR DETECTION OF COPPER

Alan Wilson Wylie, Nunawading; Peter Lewis Eisler, East Hawthorn, and Paul Huppert, North Balwyn, all of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Sept. 23, 1971, Ser. No. 183,213
Claims priority, application Australia, Nov. 18, 1970, 3236/70; Sept. 24, 1970, 2447/70
Int. Cl. G01t 1/18
U.S. Cl. 250—83.3 R **15 Claims**



A method and apparatus for the detection and estimation of copper in an ore body which involves irradiation of the body with a flux of fast neutrons to convert Cu^{63} to Cu^{62}; and detection and measurement of the 0.511 MeV peak in the gamma radiation emitted by the body due to the Cu^{62}.

A double-shielded detector for monitoring neutron fluxes is also disclosed.

3,792,254

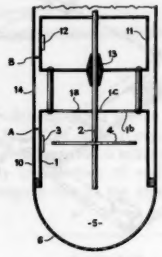
IONIZATION CHAMBER IN PARTICULAR FOR A FIRE DETECTION DEVICE

Daniel Marie Pierre Lecuyer, Le Pecq, France, assignor to Vigifeu, Aubervillias, France

Continuation-in-part of Ser. No. 790,235, Jan. 10, 1969, abandoned. This application July 15, 1971, Ser. No. 162,963

Int. Cl. G01t *1/18*

U.S. Cl. 250—83.6 FT 8 Claims



An ionization detection chamber, in particular for a fire detecting apparatus, of the type comprising an ionizing source and two electrodes each of which constitutes an ion collecting electrode of a given sign. In order to minimize the variation of the ion collection current when the surrounding pressure increases, the chamber further comprises at least one ion collecting member integral with one of the electrodes, said collecting member extending towards the ionizing source in the radiation beam of the latter.

3,792,255

RADIATION DETECTION CIRCUITRY WITH DELAY SAMPLING

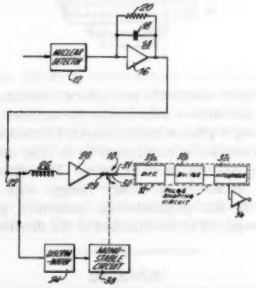
Graham White, Abingdon, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Jan. 20, 1972, Ser. No. 219,458

Claims priority, application Great Britain, Feb. 5, 1971, 4078

Int. Cl. G01t *1/16*

U.S. Cl. 250—83.3 R 8 Claims



A signal processing arrangement for shaping the signals produced by a nuclear particle detector having a variable collection time, comprises a signal shaping circuit in the form of a differentiating circuit which is connected to receive the signals to be shaped via a delay line, an amplifier, and an electronic switch. A discriminator circuit triggers a monostable circuit at the beginning of each input signal to be shaped, and the monostable circuit thereupon holds the electronic switch open for a predetermined length of time longer than the greatest collection time of the particle detector. In this way, input signals are not applied to the shaping circuit until after they have risen to their maximum level.

3,792,256

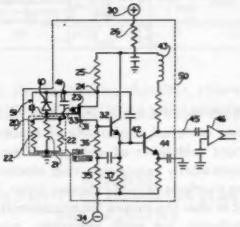
INPUT CIRCUIT FOR OPTICAL SIGNAL RECEIVER

Stephen W. Harting, Los Angeles, Calif., assignor to Computer Transmission Corporation, Los Angeles, Calif.

Filed June 19, 1972, Ser. No. 263,822

Int. Cl. H04b *9/00*

U.S. Cl. 250—199 7 Claims



This disclosure involves an improved input circuit for receivers for optical energy and particularly receivers designed to respond to data modulated optical energy. The input circuit employs a light responsive diode connected in series with a capacitance balanced coaxial resistor.

The coaxial resistor employs a stable carbon resistor connected as the series resistor with the diode and an outer encircling capacitance compensating resistor connected in the feedback path from a field effect transistor.

In another embodiment, a coaxial resistor is connected between the output and inputs of an operational amplifier. In another embodiment the light responsive diode is enclosed in a shield except for the face of the diode exposed to incoming signal.

3,792,257

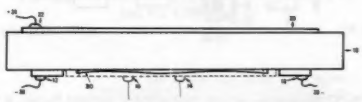
LATERAL PHOTODETECTORS

Keith L. Gardner, Los Angeles, and Kenneth B. La Baw, China Lake, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 31, 1972, Ser. No. 240,109

Int. Cl. H01i *15/00*

U.S. Cl. 250—211 J 5 Claims



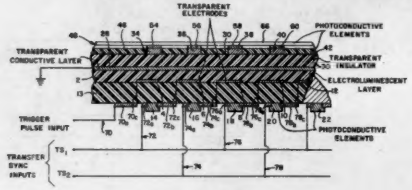
Lateral photodetectors modified such that the resistivity of the photodetector wafer is selectively varied as a function of lateral position to achieve X, Y linearity (rectilinearity).

3,792,258

PHOTOCONDUCTIVE SWITCHING SCANNER APPARATUS

Lawrence S. Sliker, 196 Willson Rd., Welland, Ontario, Canada

Filed May 3, 1972, Ser. No. 249,931
Int. Cl. H03k 21/00; H01j 31/50
U.S. Cl. 250—213 A 8 Claims



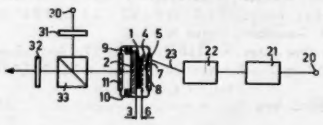
Improved high-speed scanner apparatus including a layer of energy emitting material, a plurality of spaced electrodes arranged adjacent said layer of energy emitting material, and means for sequentially energizing said electrodes to activate corresponding portions of said emissive layer. The invention is characterized in that the means for sequentially energizing the electrodes includes, for each electrode, normally disabled conductor means containing a normally non-conductive photoconductive element, said element being arranged for operation to a conductive enabling condition by the activation of a portion of the energy emitting layer associated with the next preceding electrode. Transfer synchronizing means are provided for supplying stepping pulses to the appropriate electrodes during the conductivity decay period for which the conductor means associated with the respective electrodes are in the enabled condition, whereby extremely rapid, accurately controlled scanning operation is obtained.

3,792,259

ELECTRO-OPTIC DEVICE COMPRISING AN OPTIC IMAGE RELAY AND METHOD OF MANUFACTURING SAME

Jacques Donjon, Yerres; Jean-Pierre Hazan, St. Maur, and Gerard Joseph Marcel Marie, L'Hay Les Roses, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 28, 1972, Ser. No. 238,836
Claims priority, application France, Mar. 31, 1971, 7111319
Int. Cl. H01j 39/12
U.S. Cl. 250—213 VT 4 Claims



An electro-optical device including a writing beam, a reading beam and an optic relay comprising a plate of a material having double refraction.

According to the invention, a direct voltage is applied between the faces of the plate, the information being written by modulation of the writing beam.

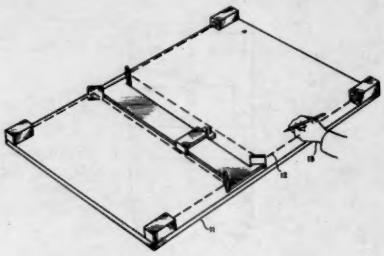
Application in information processing, display of data and the projection of images.

3,792,260

PHOTO-ELECTRIC PROTECTION SYSTEM FOR PLOTTER

Edward J. Stewart, Walnut, and James B. Olson, Anaheim, both of Calif., assignors to California Computer Products, Inc., Anaheim, Calif.

Filed Mar. 14, 1973, Ser. No. 341,091
Int. Cl. H01j 39/12
U.S. Cl. 250—215 1 Claim



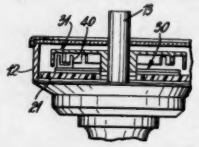
Mirrors mounted on the moving component of a machine direct the light beam of a photo-electric system for purposes of safety or control. The photo-electric components can then be mounted to stationary components of the machine.

3,792,261

ADAPTABLE PHOTOELECTRIC AUTOMOTIVE DISTRIBUTOR COMBINATION

Robert E. Canup, Chester, and Earl W. McPeak, Jr., Richmond, both of Va., assignors to Texaco Inc., New York, N.Y.

Filed Aug. 16, 1972, Ser. No. 281,064
Int. Cl. G01d 5/36
U.S. Cl. 250—233 13 Claims



A combination adaptable to replace conventional breaker points of an automotive distributor. It includes a printed circuit unit having a photoelectric contact breaker assembly attached and electrically connected to it. The unit is designed for mounting on the breaker plate. The distributor has a shutter that includes an inner flange with openings to cooperate with the photoelectric assembly, plus an outer peripheral flange, all to be attached to the distributor rotor.

3,792,262

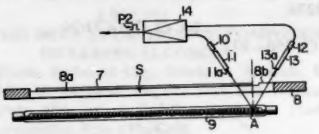
SCANNING INITIATION POSITION DETECTING DEVICE

Mutsuo Ogawa, Tokyo, and Yoshiaki Satake, Sagamihara, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1972, Ser. No. 308,928
Claims priority, application Japan, Nov. 25, 1971, 46/110461
Int. Cl. G01b 7/04
U.S. Cl. 250—223 R 10 Claims

A device comprising a light source disposed on the upper or under side of a slit formed in an original support table and ver-

tically spaced apart therefrom, and two photoelectric transducer elements disposed on the other side of the slit and vertically spaced apart therefrom, the transducer elements being arranged such that light from the same portion of the light source is incident upon them and one of them serving as a detecting element while the other serves as a reference element. As an original is fed to the original supply table, the position at which scanning of the original is initiated is detected accurately and positively irrespective of variations in the types of originals and irregularities in the intensity of light from the light source.

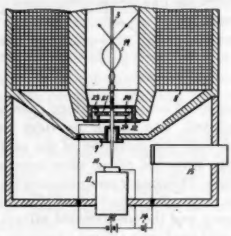


3,792,263

SCANNING ELECTRON MICROSCOPE WITH MEANS TO REMOVE LOW ENERGY ELECTRONS FROM THE PRIMARY ELECTRON BEAM

Hiroshi Hashimoto, and Susumu Takashima, both of Tokyo, Japan, assignors to Nihon Denshi Kabushiki Kaisha, Akishima, Japan

Filed Sept. 13, 1972, Ser. No. 288,688
Int. Cl. H01j *37/26;* **G01n** *23/22*
U.S. Cl. 250—311 **5 Claims**



In scanning electron microscopes, the beam of primary electrons generated by an electron gun contains low energy stray electrons as it passes through the condenser lens system on route to the specimen. The stray electrons adversely affect the secondary electron image. By incorporating a retarding electrode maintained at negative potential as described in this specification, the undesirable stray electrons are removed from the beam of primary electrons on the basis of the energy difference between the two groups of electrons.

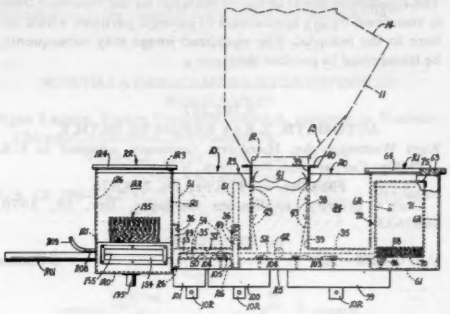
3,792,264

PHOTOGRAPHIC APPARATUS

Thomas G. Lacey, 5250 N. Sixth St., Apt. E, Fresno, Calif.

Filed Dec. 27, 1972, Ser. No. 318,933
Int. Cl. H01j *37/36*
U.S. Cl. 250—311 **6 Claims**

A photographic apparatus having a housing defining an exposing chamber adapted to be mounted in evacuated photographic alignment with an electron microscope, the housing further defining a developing chamber and a passage interconnecting the chambers; a transporting table mounted for movement in the passage and adapted to receive a film negative; and a power system for positioning the table in the exposing chamber for exposure of a negative received thereon, motivating the table to the developing chamber, removing the negative from the table, and developing a film positive from the exposed negative.

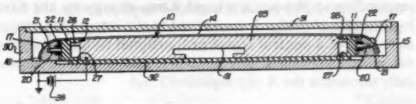


3,792,265

ENHANCEMENT OF IMAGES IN ELECTRON RADIOGRAPHY

Eric P. Muntz, Pasadena, and Murray S. Welkowsky, Los Angeles, both of Calif., assignors to Xonics, Inc., Van Nuys, Calif.

Filed Oct. 20, 1972, Ser. No. 299,378
Int. Cl. G03g *13/22, 15/22*
U.S. Cl. 250—315 **8 Claims**



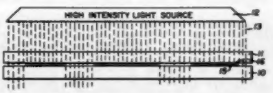
An X-ray system for producing visual images on a dielectric sheet by producing an electrostatic charge image on the sheet and then delivering oppositely charged particles to the charged sheet. Apparatus and process for increasing the electrostatic charge voltage between exposure and development, by producing the electrostatic charges in a high capacitance, low voltage configuration with the electrode and sheet in contact, and then converting to a low capacitance, high voltage configuration with the electrode and sheet spaced from each other prior to developing the visual image.

3,792,266

THERMOGRAPHIC RECORDING USING VAPORIZABLE MATERIAL AND COLORED PARTICLE DEVELOPMENT

Robert W. Gundlach, Victor, N.Y.

Continuation of Ser. No. 110,711, May 17, 1961, abandoned.
This application Nov. 26, 1971, Ser. No. 202,675
Int. Cl. G01d *15/10*
U.S. Cl. 250—318 **18 Claims**



Process of reproducing the image pattern of an original having a vaporizable material at least in the image areas by heat-

ing the image areas to cause the material to vaporize and condensing the vaporized material on the surface of a receiving sheet placed in contact with the original. The material is vaporized in the image areas by exposure to infrared radiation. The condensed latent image of material on the receiving sheet is visualized by the application of colored particles which adhere to the material. The visualized image may subsequently be transferred to another sheet.

3,792,267

AUTOMATIC X-RAY EXPOSURE DEVICE

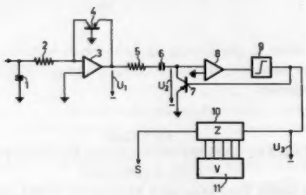
Kurt Westerkowsky, Hamburg, Germany, assignor to U.S. Phillips Corporation, New York, N.Y.

Filed Dec. 3, 1971, Ser. No. 204,476

Claims priority, application Germany, Dec. 18, 1970, 2062633

Int. Cl. H01g *1/28*

U.S. Cl. 250—322 **8 Claims**



An automatic X-ray exposure device includes a radiation detector which supplies an output current proportional to the amount of X-ray energy impinging upon the film. An integrating circuit is responsive thereto to produce a signal corresponding to the accumulated X-ray energy on the film. A logarithmic amplifier is connected to the integrating circuit so as to derive a control signal proportional to the logarithm of the integrated signal. The control signal is used to automatically terminate the X-ray exposure.

3,792,268

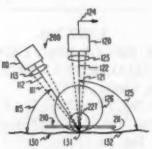
DOCUMENT SCANNER HAVING OPTICAL DIFFUSION MEANS

Brian Kenneth Bjerke, and Michael McHugh Siverling, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 6, 1972, Ser. No. 215,868

Int. Cl. G08c *9/06*

U.S. Cl. 250—219 Q **14 Claims**



An illumination provides incident radiation to a document lying in an object plane. A photodetector converts nonspecular reflections from the plane into an electrical signal. To prevent unwanted specular reflections, from plastic mail-piece windows or uneven documents, for degrading the signal-to-noise ratio, an optical diffuser is located adjacent the object plane. Both the incident and the reflected radiation pass through the diffuser, which may be a ground-glass flat.

3,792,269

SLIT SCREEN FOR X-RAY APPARATUS USED IN DETERMINING CRYSTAL TOPOGRAPHY

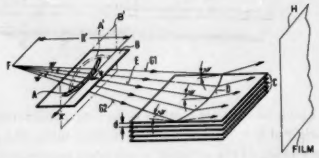
Heinrich Grienauer, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Nov. 25, 1970, Ser. No. 92,591

Claims priority, application Germany, Nov. 26, 1969, 1959226

Int. Cl. G01n *23/20*

U.S. Cl. 250—272 **3 Claims**



In an X-ray apparatus for examining crystal planes with the method of X-ray topography, in the path of the primary X-ray beam there is disposed a slit screen, the slit of which has a curved shape.

3,792,270

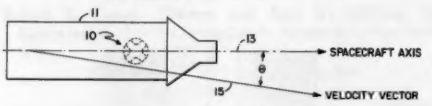
SPACECRAFT VELOCITY COMPONENT SENSOR

Robert E. Elmore, Tulsa, Okla., assignor to Avco Corporation, Tulsa, Okla.

Filed June 17, 1970, Ser. No. 46,901

Int. Cl. G01c *21/24*; **G01p** *5/20*

U.S. Cl. 250—83.3 R **9 Claims**



An omnidirectional sensor to detect changes in spacecraft attitude is disclosed. The sensor provides the capability of sensing through 360° the direction of the craft velocity component in its own principal plane when coupled with an even $2(n+1)$ port array. The sensor compensates for undesirable effects of intrinsic isotropic velocities of charged particles used in attitude sensing and the undesirable effects of electromagnetic radiation and energetic charged particles which ordinarily degrade accuracy.

3,792,271

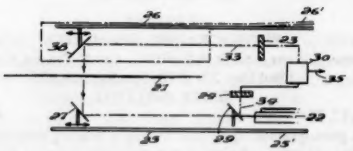
MEANS FOR DETERMINING MOISTURE CONTENT AND/OR SURFACE WEIGHT

Henry Sandblom, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Continuation-in-part of Ser. No. 236,315, March 20, 1972, abandoned. This application June 30, 1972, Ser. No. 268,116

Int. Cl. G01t *1/16*

U.S. Cl. 250—347 **6 Claims**



An arrangement for determining moisture content, surface weight or other properties of travelling paper webs includes

two detectors, at least one of which is arranged stationarily at one side of the path of the web, along with a comparison device to which the detectors are connected. Light is supplied to the fixed detector by a stationary mirror, and to the other detector by a mirror system which is movable across the web.

3,792,272

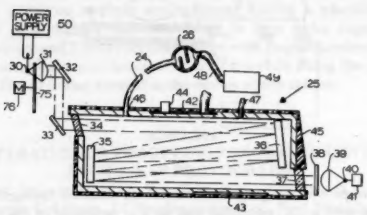
BREATH TEST DEVICE FOR ORGANIC COMPONENTS, INCLUDING ALCOHOL

Richard A. Harte, Redwood City; Edwin A. Amstutz, Santa Clara; Achille M. Bigliardi, III, San Jose, and William M. Johnson, Palo Alto, all of Calif., assignors to Omicron Systems Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 212,522, Dec. 27, 1971, abandoned. This application Jan. 12, 1973, Ser. No. 323,295

Int. Cl. G01n *21/26*

U.S. Cl. 250—343 **20 Claims**



A system for detecting volatile components in a vapor, e.g., alcohol, in the breath of a human subject. A ray of frequency-modulated and collimated light of suitable near infrared wavelength from a source such as a laser or a quartz-halogen lamp, collimated with quartz lenses and appropriate optical interference filters passes through the vapor sample via a path of fixed length and free from light losses except those caused by the volatile components being detected, and strikes a radiant energy detector, setting up an electrical signal which is amplified, electronically processed, filtered, and displayed. The concentration of alcohol or other test vapor affects the amount of energy able to pass through the sample to the detector. The detector determines the energy absorbed by the sample and transmits the result to a readout device, meter, or permanent recording means. The sample can be collected by taking an alveolar (deep lung) sample of the subject's breath. The system determines, through Henry's law, the blood content of alcohol, ketones, aldehydes, various anesthesias and the like. This system is also applicable to determine combustible gases, for example, in coal mines.

3,792,273

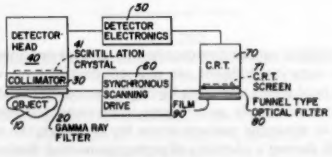
SCINTILLATION CAMERA WITH IMPROVED RESOLUTION

Lowell C. Bergstedt, Schaumburg, Ill., assignor to G. al. Searle & Co., Chicago, Ill.

Filed Feb. 10, 1972, Ser. No. 225,055

Int. Cl. G01t *1/20*

U.S. Cl. 250—71.5 S **3 Claims**



An Anger-type scintillation camera system fitted with a gamma ray filter between the object under study and the detector and an output signal filter in the form of a funnel-type optical filter between the cathode ray tube of the detector and an image recording film. The gamma ray filter and funnel-type optical filter scan in synchronism so that the total radioactivity distribution in the object is documented on the film.

3,792,274

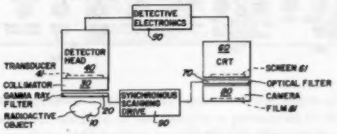
SCINTILLATION CAMERA WITH IMPROVED RESOLUTION

Agne Larson, Vastra Frolunda, Sweden, assignor to Nuclear-Chicago Corporation, Des Plaines, Ill.

Filed Oct. 19, 1971, Ser. No. 190,618

Int. Cl. G01t *1/20*

U.S. Cl. 250—368 **10 Claims**



An Anger-type scintillation camera system fitted with a gamma ray filter between the object under study and the detector and an output signal filter, in mechanical or electrical form, associated with an image recording film. The gamma ray filter and output signal filter scan in synchronism so that the total radioactivity distribution in the object is documented on the film.

3,792,275

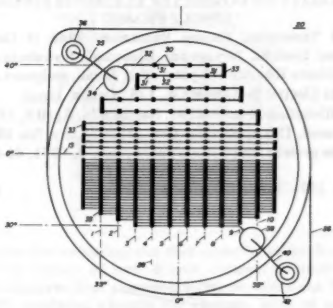
INFRARED INTRUSION SENSOR

Richard F. Leftwich, Pound Ridge, N.Y., and Robert T. Ensor, Redding, Conn., assignors to Barnes Engineering Company, Stamford, Conn.

Filed Dec. 26, 1972, Ser. No. 317,983

Int. Cl. G01t *1/16*

U.S. Cl. 250—338 **7 Claims**



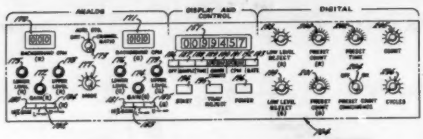
An infrared intrusion sensor is provided to detect a human target anywhere in a 20 × 20 foot area. A wide angle portrait-type lens of germanium is utilized to provide reasonably uniform imaging over the field of view of approximately 70° × 70°, while still focusing on a flat image plane. This allows the use of a flat, extended thermopile detector having all active junctions which are arranged in columns to cover the desired area, and connected so that the columns alternate in a positive-negative configuration. The detector junctions have different sizes and spacing, with the junction concentration being roughly inversely proportional to the square of the range.

3,792,276

METHOD AND APPARATUS FOR PROGRAMMING LIQUID SCINTILLATION SPECTROMETERS

Joseph R. Toman, Naperville, and Edmund Frank, Chicago, both of Ill., assignors to Packard Instrument Company, Inc., Downers Grove, Ill.

Filed Oct. 12, 1971, Ser. No. 188,359
Int. Cl. G21h 5/00
U.S. Cl. 250—369 9 Claims



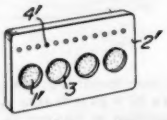
In an automatic scintillation counting device adapted to detect and measure the radioactivity of a multiplicity of samples supplied in trays or other sets, provisions are made for automatically changing one or more of the analog counting parameters, or analog-plus-digital parameters, for each set. The changes are effected automatically as each sample set comes into counting position, thereby permitting unattended automatic counting of samples requiring entirely different counting parameters. At the analyst's option, two or more sets may be counted under conditions established for one of the sets. Provisions are also made for retaining the operation of the master, or front panel, control when it is unnecessary to vary the counting program parameters for particular sets.

3,792,277

APPARATUS FOR INDIVIDUALLY MEASURING A PLURALITY OF DOSIMETER ELEMENTS FIXED IN A SINGLE FRAME

Tadaoki Yamashita; Osamu Yamamoto, both of Hirakata; Hajimu Oonishi, Neyagawa; Hidetsugu Kawabata, Kobe, and Saburo Kitamura, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 26,676, April 8, 1970, abandoned. This application Oct. 13, 1971, Ser. No. 188,802
Claims priority, application Japan, Aug. 9, 1971, 46-60428
Int. Cl. G01t 1/11
U.S. Cl. 250—369 1 Claim



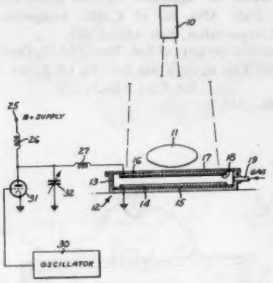
A thermoluminescence dosimetry system in which a composite thermoluminescence dosimeter having a plurality of thermoluminescent elements fixed in a single frame and a thermoluminescence readout instrument are combined to efficiently, simply and reliably analyze the doses of radiant rays.

3,792,278

ELECTRON RADIOGRAPHIC IMAGING CHAMBER WITH CURRENT ENHANCEMENT

Andrew P. Proudian, Chatsworth, Calif., assignor to Xonics, Inc., Van Nuys, Calif.

Filed Nov. 10, 1972, Ser. No. 305,339
Int. Cl. G01t 1/18
U.S. Cl. 250—382 4 Claims



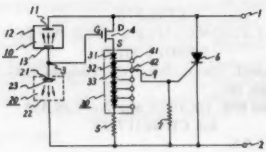
An improved imaging chamber for an electron radiographic system with a d.c. potential and an a.c. potential in the radio frequency range connected across the electrodes to provide increased current collection while reducing interelectrode discharge problems.

3,792,279

IONIZATION SMOKE DETECTOR

Koju Sasaki, Tokyo, Japan, assignor to Nittan Company, Limited, Tokyo, Japan

Filed Oct. 29, 1971, Ser. No. 193,901
Claims priority, application Japan, Nov. 19, 1970, 45-114352
Int. Cl. G01t 1/18
U.S. Cl. 250—83.6 R 1 Claim



An ionization smoke detector having at least one ionization chamber open to ambient air and connected to a voltage supply, a field effect transistor having a source-drain path connected to said supply and a gate interconnected with said chamber to sense the voltage across the chamber, the source-drain path having a plurality of series connected diodes in series therewith and terminals connected to the junctions between the diodes in order to obtain a desired output voltage from the transistor upon the detection of smoke.

3,792,280

ISOTROPIC NEUTRON SPECTROMETER

Harley V. Piltingsrud, Idaho Falls, Idaho, assignor to The United States of America as represented by the Secretary of the United States Air Force, Washington, D.C.

Filed Nov. 3, 1972, Ser. No. 303,438
Int. Cl. G01t 3/00, 1/11
U.S. Cl. 250—390 4 Claims

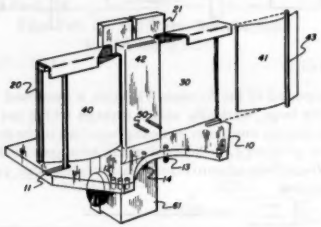
An isotropic neutron spectrometer having a plurality of radial polyethylene rods positioned in bore holes angularly spaced around a polyethylene sphere with thermoluminescent dosimeter pairs positioned at spaced intervals along the rods. A TLD pair is also located in the center of the sphere.

3,792,281

APPARATUS FOR PRODUCING PANORAMIC DENTAL ARCH X-RAY PHOTOGRAPHS

Robert Schwartz, 1271 Westfield Ave., Rahway, N.J., and Morris Goldberg, 14 Vanderventer Ave., Port Washington, N.Y.

Filed Oct. 16, 1972, Ser. No. 297,900
Int. Cl. G01n 21/00; H01j 37/00
U.S. Cl. 250—444 8 Claims



Panoramic X-ray photographs of the upper and lower dental arches are secured with a portable film holder apparatus that is used in conjunction with an independent X-ray unit. The film holder is composed of a photographic plate holder assembly used in combination with a sectional shield assembly. The shield assembly is adapted to engage the photographic plate holder assembly to cover a unitary photographic plate positioned within the holder assembly and to assist in the formation of a panoramic X-ray photograph from at least three sequentially secured X-ray photographs taken of various portions of the dental arch structure.

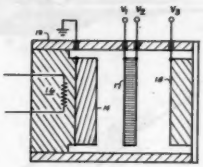
3,792,282

STIMULATED EXOELECTRON EMISSION DOSIMETER HAVING HIGH SPATIAL RESOLUTION

Peter F. Braunlich, Bloomfield Hills, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sept. 27, 1971, Ser. No. 184,153
Int. Cl. G01t 1/02
U.S. Cl. 250—459 10 Claims

A dosimeter having high spatial resolution is described. The inventive dosimeter includes a sample of a material which exhibits exoelectron emission during optical, thermal or radiation stimulation after having been exposed to the type of radiation the detection of which is desired. Exoelectrons emanating from the sample are detected by a microchannel plate (MCP) which releases a large number of electrons for each electron it receives. The electrons emanating from the output surface of the microchannel plate impact a detection surface which yields a visual indication in response to the impacting electrons. Because microchannel plates multiply electrons in well defined channels the spatial distribution of electrons leaving the surface of the sample is preserved at the output surface of the MCP. The spatial distribution of electrons impacting the detection surface is thus identical to that of the electrons emanating from the surface of the sample material. Accordingly, the spatial distribution of the radiation to which the sample was originally exposed is duplicated across the detection surface, thereby making it possible to determine both the intensity and spatial distribution of the radiation to which the sample was subjected.

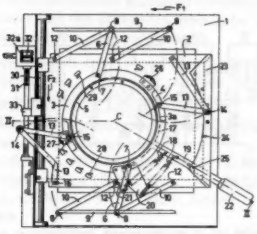


3,792,283

DEVICE FOR CENTERING AN X-RAY FILM CASSETTE

Jacques Lebra, Colombes, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 30, 1972, Ser. No. 302,112
Claims priority, application France, Nov. 18, 1971, 71.41259
Int. Cl. H01j 37/22
U.S. Cl. 250—468 5 Claims



A device for centering the film cassette in an X-ray apparatus by means of two double systems of rods which together comprise four clamping members which can be symmetrically displaced towards the cassette, each of said rod systems being individually elastically coupled to a common operating member.

3,792,284

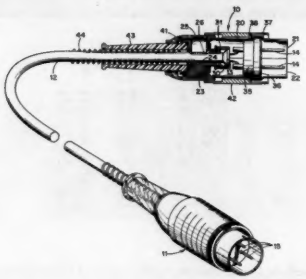
ELECTRO-OPTIC TRANSMISSION LINK

Oscar J. Kaelin, Harvard, Mass., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Oct. 13, 1972, Ser. No. 297,317
Int. Cl. G02b 5/14
U.S. Cl. 250—551 7 Claims

An electro-optic link for transmitting signals including a length of flexible fiber optic light guide, a light emitting diode

(LED), and a photo-diode. One end of the light guide and the LED are mounted in fixed relationship in a first coupling having electrical connector pins for mating with a receptacle in one unit of a system. The other end of the light guide and the photo-diode are mounted in fixed relationship in a second coupling having electrical connector pins for mating with a



receptacle in another unit of the system. The electro-optic link provides a unitary structure for transmitting signals from one unit of a system to another unit. Electrical signals from the one unit are converted to light signals by the LED, the light signals are transmitted by the flexible fiber optic light guide to the photo-diode, and are reconverted to electrical signals by the photo-diode for utilization in the other unit.

3,792,285

ELECTRONIC CIRCUIT INSTALLATIONS

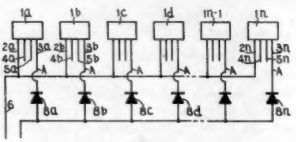
Brian John Procter, Stevenage; Colin Sidney Osborne, Sandy, and Ignacy Krajewski, Hitchin, all of England, assignors to International Computers Limited, London, England

Filed Aug. 23, 1972, Ser. No. 283,075

Claims priority, application Great Britain, Aug. 25, 1971, 39,869/71; Mar. 28, 1972, 14,405/72

Int. Cl. H02j *3/14*

U.S. Cl. 307—38 **4 Claims**



The circuits of a multicircuit installation using common power feeders, are tested by being electrically isolated from the other circuits, individually activated and tested.

3,792,286

COMBINING INVERTERS FOR HARMONIC REDUCTION

Udo H. Meier, Luzern, Switzerland, assignor to Reliance Electric Company, Cleveland, Ohio

Filed Oct. 12, 1971, Ser. No. 187,974

Int. Cl. H02j ; H02m

U.S. Cl. 307—58 **36 Claims**

A plurality of polyphase inverters are connected in circuit to substantially common polyphase loads through a polyphase reactor. Windings from each phase of each inverter are provided on the reactor to cancel the component of flux of the fundamental frequency within the reactor and to have the reactor substantially absorb the NP±1 harmonics where N is the number of inverters and P is the number of phases. For two three-phase inverters this substantially cancels the fifth and seventh harmonic voltages within the reactor applying a true 12-step voltage wave to each of the two common three-phase loads with nothing smaller than the 11th harmonic voltage supplied to each load. The two inverters are phase displaced by 360°/2NP which normally at a 30° phase angle

would be a voltage loss of 3 ½ percent applied to the load yet this reactor connection applies 100 percent voltage to the loads and the load power factor is reflected directly to each inverter. The loads may be DC isolated, permitting series connection of the inputs of the inverters from a single high voltage DC supply.

3,792,287

NON-LINEAR OPTICAL CRYSTAL AND DEVICES

George W. Roland, Monroeville, and John D. Feichtner, Murrysville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 17, 1971, Ser. No. 181,409

Int. Cl. H03f *7/00;* **H02m** *5/00*

U.S. Cl. 307—88.3 **25 Claims**

A compound of the formula Tl_3AsSe_3 is disclosed. It can be made into large, optically useful crystals which are birefringent and display nonlinear optical properties in the infrared. A harmonic generator, an optical parametric oscillator, and an optical frequency upconverter incorporating this crystal are also disclosed.

3,792,288

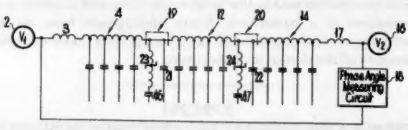
A. C. POWER TRANSMISSION SYSTEMS

Erich Siegfried Friedlander, Sutton Coldfield, England, assignor to Associated Electrical Industries Limited, London, England

Filed Aug. 9, 1972, Ser. No. 278,927

Int. Cl. H02j *3/24*

U.S. Cl. 307—102 **5 Claims**



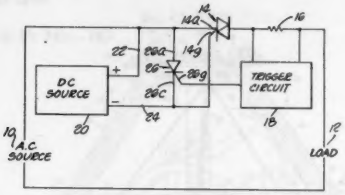
An alternating current power transmission system having a transmission line and at least one saturated reactor connected in shunt with the transmission line, in which there are provided control means for controlling the current voltage characteristic of the reactor to give a positive damping of oscillations induced in the system as a result of a disturbance occurring in the system.

3,792,289

SOLID STATE CIRCUIT BREAKER

Abdollah Kazem, 1236 E. Edinger Suite H, Santa Ana, Calif.

Filed July 3, 1972, Ser. No. 268,529
Int. Cl. H02h 7/00
U.S. Cl. 307—125 6 Claims



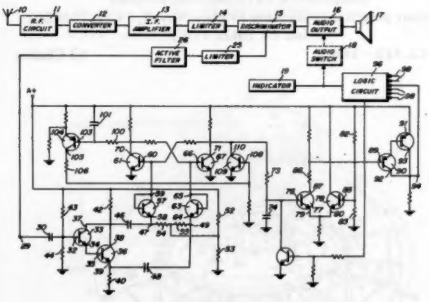
A fast acting circuit for controlling alternating electric current by placing an impedance element in series between the source and the load and sensing the voltage developing across the element with a trigger circuit where the output of the trigger circuit is coupled to a solid state latching device and also coupled in series with the current source whereby AC current in excess of a pre-selected amount causes the trigger to actuate the latch to interrupt the current flow from the source, the latch maintaining the interruption until manually reset.

3,792,290

TONE DETECTOR WITH CONSTANT DETECTION RESPONSE TIME

John Race Brocker, Batavia, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Feb. 20, 1973, Ser. No. 334,186
Int. Cl. H03k 5/20
U.S. Cl. 307—233 13 Claims



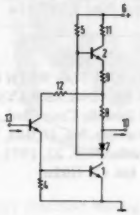
A detector for detecting any one of the particular tone frequency signals in a range of tone frequency signals and which has a constant detection response time includes a converter operative in response to the particular tone frequency signals coupled thereto exceeding a predetermined threshold to develop square wave signals having substantially a 50% duty cycle. An integrator, coupled to the converter integrates the square wave signals to develop an integration voltage. The integration voltage reaches a predetermined amplitude level in response to the square wave signals in the constant detection response time causing actuation of a switching circuit which develops a detection signal.

3,792,291

CIRCUIT ARRANGEMENT FOR IMPROVING THE SHORT CIRCUIT RESISTANCE OF THE SLOWER INTERFERENCE-FREE LOGIC CIRCUITS

Heinz Zietemann, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Sept. 18, 1972, Ser. No. 290,130
Claims priority, application Germany, Sept. 28, 1971, P 21 48 437.7
Int. Cl. H03k 17/00
U.S. Cl. 307—239 6 Claims



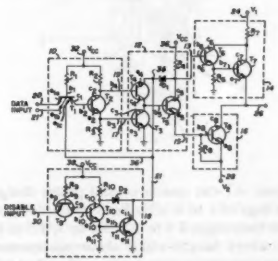
The emitter-collector paths of two transistors of an amplifier are connected in series by way of a series circuit of two resistors and a diode having the same conductivity direction as that of the transistors. The connecting point of the collector of the first transistor with the diode is located at the base of the second transistor and the connecting point of the diode with the first resistor is located at the output terminal of the amplifier. The connecting point of the two resistors is connected by way of a further resistor to the collector of the third transistor whose emitter is connected to the base of the first transistor and which is controlled at its base to render one of the first transistors conductive while the other is nonconductive. In case of a short circuit at the output of the amplifier and in case of a conductive second transistor, the short circuit current creates, at the resistors between the second transistor and the diode, such a voltage that the Zener voltage of the diode is achieved. The diode becomes conductive in the reverse direction and lowers the voltage at the base of the second transistor. Therefore the second transistor transfers to the unsaturated condition and the current is limited by the second transistor and the serially connected resistors.

3,792,292

THREE-STATE LOGIC CIRCUIT

Ury Priel, Cupertino, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 108,359, Jan. 21, 1971, abandoned. This application June 16, 1972, Ser. No. 263,680
Int. Cl. H03k 19/08, 19/28, 19/38
U.S. Cl. 307—209 10 Claims



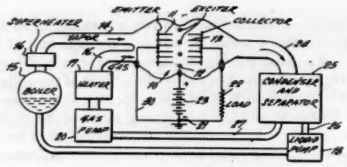
An improved three-state logic circuit for selectively providing active sourcing, active sinking or high impedance isolation

of the circuit output terminal so as to develop "true" output, "false" output or third state, high impedance output signals. A first T^2L data input circuit selectively drives, through a buffer stage, an active pull-up circuit and an active pull-down circuit in response to logic input signals, and a second T^2L output disable circuit cooperates with the buffer stage to selectively disable the active pull-up and pull-down circuits in response to a disable signal.

ERRATUM

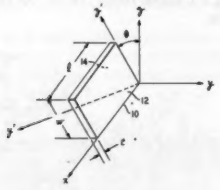
For Class 307—66 see:
Patent No. 3,792,314

3,792,293
ELECTROSTATIC GENERATOR WITH CHARGING AND COLLECTING ARRAYS
Alvin M. Marks, 149-61 Powells Cove Blvd., Whitestone, N.Y.
Continuation-in-part of Ser. No. 16,048, March 3, 1970, abandoned. This application Nov. 22, 1971, Ser. No. 200,766
Int. Cl. H02n
U.S. Cl. 310—5 **8 Claims**



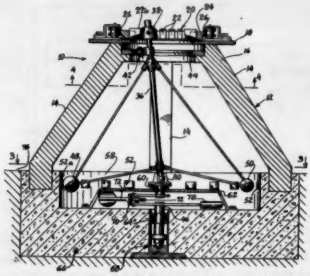
A device is described for transducing heat-kinetic power into electrical power using a charged aerosol, which flows through a sheet conversion space having emitting and exciter arrays to charge and form droplets at the entrance plane and a collector array to discharge the droplets at the exit plane and to supply electrical power to load; which results in increased efficiency with greater output power and current at a smaller voltage.

3,792,294
RECTANGULAR AT-CUT CRYSTAL PLATE
James Jerome Royer, Hanover, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Oct. 19, 1972, Ser. No. 299,084
Int. Cl. H01v 7/00
U.S. Cl. 310—9.5 **7 Claims**



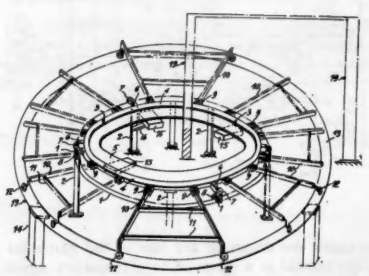
Rectangular AT-cut quartz crystal plates designed for the frequency range of 1 to 6 MHz have width-to-thickness ratios chosen from the ranges 2.5 to 3.5, 5.5 to 7, 8.5 to 10, and 11.5 to 13.5 to avoid length-width shear resonances and thus eliminate unwanted resonances near the desired thickness-shear resonance. These rectangular AT-cut plates offer significant manufacturing and packaging advantages over existing AT-cut plates.

3,792,295
ELECTROMAGNETIC DRIVE SYSTEM
Frank Garbi, 48-21 40th St., Long Island City, N.Y.
Filed May 2, 1972, Ser. No. 249,560
Int. Cl. H02k
U.S. Cl. 310—46 **6 Claims**



A machine for generating compressive energy from kinetic energy, comprising a plurality of weights mounted for rotation on a shaft which is disposed at an angle with respect to the axis of rotation. The shaft, and the weights mounted thereon, are driven about the axis of rotation by an electromagnetic drive comprising a segmented annular electromagnet, each segment of which is energized in advance of a magnetically sensitive element on the shaft to rotate the element, shaft and the weights about the axis. By suitable crankshaft linkage, the rotational motion is transmitted to linear motion of pistons which yield the compressive energy to be generated.

3,792,296
AUTOMOTIVE STRUCTURE FOR REVOLVING STANDS
Pierre Albert Lefebvre, Sille-le-Guillaume, France, assignor to G.M.T. S.A., Le Mans, France
Filed Nov. 9, 1971, Ser. No. 197,041
Claims priority, application France, Nov. 9, 1970, 7040208
Int. Cl. H02k 41/02
U.S. Cl. 310—166 **13 Claims**



A rotary stand comprises an annular track, an annular rotor revolvably mounted on said track including an armature ring cooperative with at least one inductor fixed relative to said track, said rotor having attached thereto carriages movably supported on an annular runway concentrically surrounding said track.

3,792,297

RELUCTANCE MACHINE HAVING EQUALIZING WINDINGS

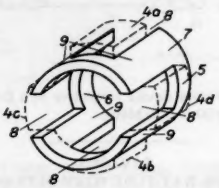
Vilmos Torok, Nordanvindsgatan 6, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Dec. 30, 1971, Ser. No. 213,938

Claims priority, application Sweden, Dec. 31, 1970, 7017849

Int. Cl. H02k 3/16

U.S. Cl. 310—183 3 Claims



A reluctance machine has a stator with a plurality of stator poles arranged tangentially one after the other and carries at least one stator winding. The rotor has a plurality of pole pairs equally angularly spaced. The rotor has an equalizing winding composed of coils in the form of a hollow cylinder of conductive material provided with longitudinal slots extending alternately from opposite ends receiving the rotor poles, the parts of the cylinder between the slots being joined at alternate ends by arcuate parts, the induced voltages in the coils counteracting each other.

3,792,298

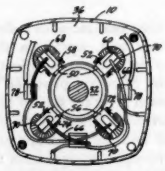
ELECTRIC MOTOR BRUSH CARD

Lyle J. Hamman, Eaton Rapids, Mich., assignor to Eaton Stamping Company, Eaton Rapids, Mich.

Filed Aug. 24, 1972, Ser. No. 283,525

Int. Cl. H02k 13/00

U.S. Cl. 310—242 9 Claims



The invention pertains to electric motor brush structure wherein a planar dielectric support in the form of a card is mounted within a motor housing in a plane perpendicularly disposed to the motor armature axis. A plurality of brush holders are mounted upon the card concentrically arranged about an armature receiving opening defined therein, and the brush holders are of a sheet metal construction of U-cross-sectional configuration having open ends and slots defined in base and leg portions for receiving a brush conductor and portions of a coil tension spring which engages a brush slidably received within each holder for biasing the brush radially inwardly into engagement with the armature commutator.

3,792,299

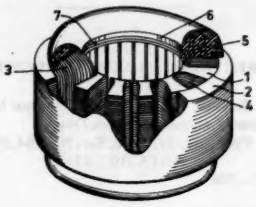
STATOR FOR ELECTRIC MOTORS

Stig Lennart Hallerback, Vastra Frolunda, Sweden, assignor to SKF Industrial Trading and Development Company N.V., Amsterdam, Netherlands

Filed May 17, 1972, Ser. No. 254,302

Int. Cl. H02k 1/12

U.S. Cl. 310—258 2 Claims



An electric rotary machine having a stator and a rotor, an annular air gap between the stator and the rotor, said stator comprising an outer annular yoke and a plurality of radially directed stator teeth circumferentially spaced apart to define a plurality of openings between adjacent teeth and extending the full radial depth of the teeth, stator windings in the openings between the stator teeth and a moulding adjacent axial ends of the stator forming an insulation for the stator windings and locating and holding together the stator teeth and stator windings as a rigid assembly, the inner ends of said teeth being formed with pointed tooth shoulders wherein adjacent shoulders are closely spaced apart to provide a narrow gap therebetween.

3,792,300

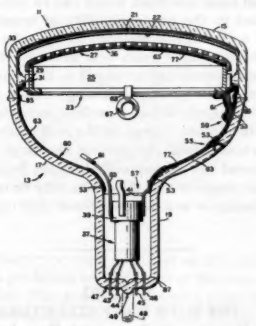
CATHODE RAY TUBE HAVING A CONDUCTIVE METALLIC COATING THEREIN

David Benda, Geneva, N.Y., and Donald R. Kerstetter, Emporium, Pa., assignors to GTE Sylvania Incorporated, Seneca Falls, Del.

Filed June 15, 1972, Ser. No. 263,297

Int. Cl. H01j 29/46

U.S. Cl. 313—85 R 7 Claims



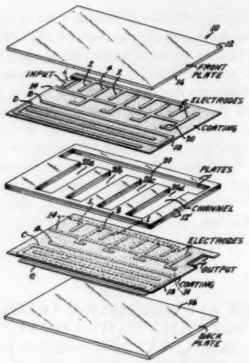
An improved color cathode ray tube of the shadow mask type is provided wherein localized areas of a primary conductive substance are disposed on the interior surface of the envelope funnel and neck portions separately covering the high voltage button and gun assembly contact areas. A substantially continuous secondary reflective coating of gas-sorbtive electrically conductive metallic material, providing ad-

vantageous life performance results, is disposed over the back surface of the shadow mask and over the interior surface of the funnel portion to provide a final anode coating effecting a peripheral unipotential field for the tube and electrically connecting the mask-screen area and the aforementioned localized primary coated areas. A thin tertiary film of high-efficiency gas-adsorbing getter material is disposed over at least a portion of the secondary conductive coating material.

3,792,301
TWO DIRECTIONAL PLASMA CHARGE TRANSFER DEVICE

Clarence W. Kessler, Oakwood, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed Aug. 28, 1972, Ser. No. 284,396
Int. Cl. H01j *61/06*
U.S. Cl. 313—188 **3 Claims**



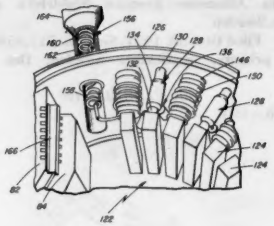
A Two Directional Plasma Charge Transfer Device utilizing an ionizable gas in an enclosure having a primary channel and a plurality of secondary channels extending laterally therefrom, an input electrode which can be directly or capacitively coupled to the gas, a plurality of transfer electrodes coated with a dielectrical material on opposite internal walls of the enclosure offset from one another throughout the length of the channels and arranged so that upon application of input signals, the gaseous discharge transfers successively between subsequently offset transfer electrode pairs by the transfer of the electric charge on the wall coating of the electrode which results from the gaseous discharge, first along the primary channel and subsequently laterally from the direction of its original travel so that the device may be used preferably as a graph display or as a two directional shift register.

3,792,302
VHF SLOW WAVE STRUCTURE

Arthur H. Downing, Woburn, and Hans-Joachim Krahn, Burlington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 22, 1972, Ser. No. 317,586
Int. Cl. H01j *25/34*
U.S. Cl. 315—3.6 **4 Claims**

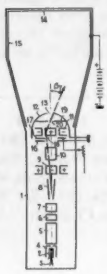
A very high frequency electromagnetic energy device with a slow wave structure is disclosed having impedance matching means and lumped as well as distributed elements for energy propagation. An embodiment comprises a backward wave oscillator device incorporating elements used at microwave frequencies together with lumped capacitance and inductance elements to provide a device operative in a frequency range of, illustratively 100 to 200 MHz.



3,792,303
CATHODE-RAY TUBE WITH DEFLECTION AMPLIFICATION AND POST-DEFLECTION ACCELERATION

Andre Albertin, and Bernard Chartier, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 1, 1971, Ser. No. 194,737
Claims priority, application France, Oct. 30, 1970, 70.39262
Int. Cl. H01j *29/70*
U.S. Cl. 315—17 **6 Claims**



In a cathode-ray tube that includes a slotted post-deflection acceleration electrode and, upstream thereof, an adjacent quadrupolar lens for deflection amplification, in order to correct image distortion, there are provided two slotted correcting electrodes disposed at either side of said quadrupolar lens. The correcting electrode situated between the secondary acceleration electrode and the quadrupolar lens is at the same potential as the secondary acceleration electrode, while the correcting electrode upstream of said quadrupolar lens has a slot with a configuration similar, but oriented perpendicularly to that of the slot provided in the post-deflection acceleration electrode.

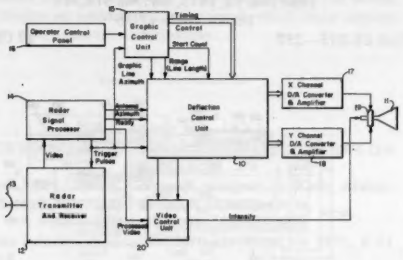
3,792,304
SCALED GRAPHIC LINE DISPLAY ON CATHODE-RAY TUBE WITH UNIFORM BRIGHTNESS

Rudolph Dalena, Placentia, Calif., and Donald F. Walker, Boulder, Colo., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed July 24, 1972, Ser. No. 274,548
Int. Cl. H01j *29/72*
U.S. Cl. 315—18 **5 Claims**

In a radar PPI display system, uniform brightness is maintained for graphic lines displayed between radar sweeps by

generating every graphic line at the same rate regardless of range scale selected. Range data for each graphic line is scaled



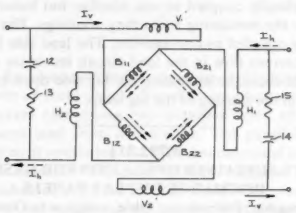
as a function of range scale in a range counter which counts down clock pulses at a fixed rate, thus scaling each graphic line as a function of range scale.

3,792,305

DEFLECTION YOKE WITH BRIDGE-CONNECTED WINDINGS

John W. Lister, Portsmouth, Va., assignor to General Electric Company, Portsmouth, Va.

Filed Dec. 23, 1971, Ser. No. 211,341
Int. Cl. H01j *29/70*
U.S. Cl. 315—22 XY **11 Claims**



A yoke assembly having windings for producing magnetic fields to deflect an electron beam in a predetermined manner. A first and a second set of windings are disposed upon a core for deflecting the electron beam in a vertical and a horizontal sense, respectively. A set of four auxiliary windings is disposed upon the core about points where the horizontal and vertical deflection windings would ordinarily overlap. The auxiliary windings are then connected in series to form a closed, four-sided loop or bridge. The bridge is connected in series with both the first and the second set of deflection windings such that the windings of the first set are coupled to opposing nodes of the bridge, and the windings of the second set are coupled to the other, remaining nodes. The effective resistances across the newly-connected first and second sets of windings are substantially decreased while the inductances thereof are virtually unchanged so that the L-R ratios thereof are substantially improved.

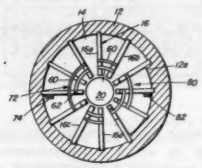
In one embodiment, the first and second sets of windings are distributed in patterns characterized by relatively low fifth-order and higher harmonics. In still another embodiment, each auxiliary windings has turns of an additional adjacent auxiliary winding interposed intermediate its ends.

3,792,306

MULTISIGNAL MAGNETRON HAVING PLURAL SIGNAL COUPLING MEANS

William A. Smith, Winchester, and John R. Butler, Lexington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 4, 1972, Ser. No. 312,180
Int. Cl. H01j *25/50*
U.S. Cl. 315—39.57 **10 Claims**



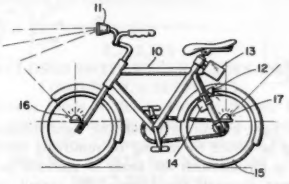
A crossed field microwave energy device of the magnetron type is provided with a reentrant cavity resonator circuit having isolated groupings of elements to simultaneously yield separate resonant frequencies through energy exchanging relationship with a common electron space charge circulating in the interaction region adjacent to the circuit. In an illustrative embodiment two frequencies, f_1 and f_2, are provided by interaction with group of strapped anode vanes interrupted by intermediate inactive drift regions. The tube is operated under either pulsed or continuous wave conditions. Separate output antenna means couple energy from each circuit to a utilization load.

3,792,307

BICYCLE SAFETY LIGHTING GENERATOR-BATTERY SYSTEM

Donald L. Baker, 530 Alma Real Dr., Pacific Palisades, Calif.

Filed July 26, 1972, Ser. No. 275,196
Int. Cl. B62j *5/00*
U.S. Cl. 315—77 **5 Claims**

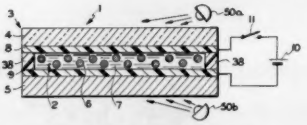


A generator-battery circuit connects to the head and tail lights and in the preferred embodiment of the invention, auxiliary safety lights. The generator is driven from the bicycle wheel to energize the lights when the bicycle is traveling above a given speed. The battery circuit connects in bucking voltage relationship with the generator circuit and includes a series connected diode such that the battery is effectively disconnected when the generator is energizing the lights. On the other hand, when the bicycle slows below the given speed or is motionless, the battery voltage exceeds the generator voltage and energizes the lights. The auxiliary safety lights are mounted on the front and rear portions of the bicycle and provide 360° illumination in azimuth when the bicycle is stationary or traveling at low speeds.

3,792,308
ELECTROPHORETIC DISPLAY DEVICE OF THE LUMINESCENT TYPE

Isao Ota, Osaka, Japan, assignor to Matsushita Electric Industries Co., Ltd., Kadoma, Osaka, Japan

Filed June 8, 1970, Ser. No. 44,023
Int. Cl. H05b 33/00, 43/00
U.S. Cl. 315—150 39 Claims

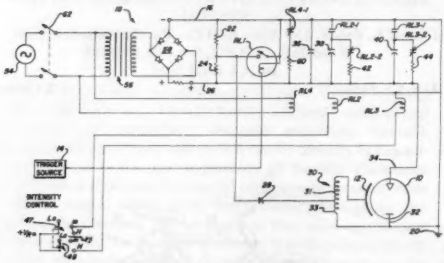


An electrophoretic display and/or recording device of the luminescent type in which a luminescent electrophoretic suspension layer including a dispersion of at least one electrophoretic material in a finely divided powder form suspended in a suspending medium is interposed between a pair of electrodes. Said suspension layer includes at least one luminescent component therein and emits luminescent light when radiation flux or electric field is applied thereto. An electric field is imposed across the electrophoretic suspension layer to change the luminescent property of the suspension layer by changing the spatial distribution of the electrophoretic material in the suspending medium elctrophoretically.

3,792,309
STROBE LIGHT INTENSITY CONTROL

Clement J. McDonald, River Forest, Ill., assignor to Multi Electric Mfg. Inc., Chicago, Ill.

Filed Aug. 30, 1972, Ser. No. 285,091
Int. Cl. H03b 41/00
U.S. Cl. 315—200 A 9 Claims

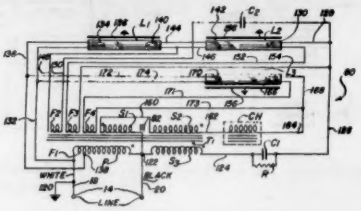


A strobe light circuit in which the light intensity of the strobe lamp is varied by adding or removing selected flash capacitors in circuit with the lamp to increase or decrease surge current through the lamp. The circuit connection between each of the flash capacitors and the strobe lamp is controlled by a double-pole, double-throw relay with a normally open relay contact in series with the flash capacitor to enable it to charge and discharge and a normally closed contact across the flash capacitor to discharge it when it is not being used to provide a portion of the surge current. Both contacts are connected at the low side of the power line to minimize electrical arcing and are mechanically linked together such that the conducting set of contacts always breaks contact before the nonconducting set of contacts closes. Intensity control switches are provided to energize the relay coils for the selected capacitors. One flash capacitor is always connected across the strobe lamp to maintain a minimum light intensity, and this capacitor is discharged through a normally closed relay contact when power for the entire circuit is interrupted.

3,792,310
THREE-LAMP LEAD LAG RAPID START BALLAST APPARATUS

Joseph A. Crawford, Chicago, Ill., assignor to Advance Transformer Co., Chicago, Ill.

Filed Dec. 12, 1972, Ser. No. 314,399
Int. Cl. H05b 41/16
U.S. Cl. 315—257 17 Claims

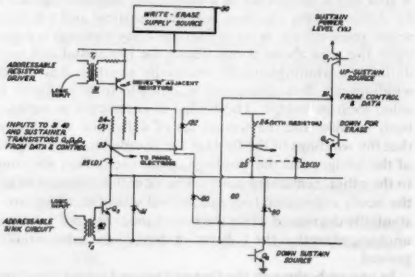


A ballast for rapid start gaseous discharge lamps to ignite and operate three such lamps from a source of a.c. voltage greater than the igniting voltage of the lamps comprising a lead side made up of two lamps in series with a shunting condenser across one lamp and an operating condenser in series with both lamps, the lamps and operating condenser being connected across an autotransformer including primary and secondary windings additive but loosely coupled; and a lag side made up of one lamp in series with the same primary winding and two secondary windings, the latter secondary windings being connected additive with the primary winding and together therewith in series with a choke and the single lamp. The primary and all secondary windings and filament windings are mounted on the same core with all filament windings, primary winding and one of the lag side secondary windings closely coupled to one another but loosely coupled relative to the remaining secondary windings. The latter two are closely coupled to one another. The lead side lamps start first and current flow in the lead circuit increases voltages in the lag side secondaries raising the lag side open circuit voltage to aid in the starting of the lag lamp.

3,792,311
SPLIT-SUSTAINER OPERATION FOR GASEOUS DISCHARGE DISPLAY PANELS

Ray L. Trogdon, Perrysburg, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed June 7, 1972, Ser. No. 260,687
Int. Cl. H05b 37/00
U.S. Cl. 315—169 TV 6 Claims



There is disclosed an improved sustainer supply system that allows more economical addressing techniques for gaseous

discharge display panels. There is particularly disclosed a sustainer supply system wherein the panel discharge currents need not be carried by the addressing drive circuitry. According to the invention each panel electrode or conductor line is addressable by a resistor-diode addressing matrix. The invention provides an addressable sink circuit which sinks current from any diode resistor combination.

3,792,312

DEVICE FOR CREATING ELECTROSTATIC CHARGE OR DISCHARGE

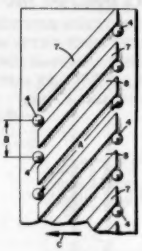
Gerhard Marx, Hahn, Germany, assignor to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Filed Sept. 14, 1972, Ser. No. 289,053

Claims priority, application Germany, Sept. 17, 1971, P 21 46 539.4

Int. Cl. H01t *19/04*

U.S. Cl. 317—2 F 5 Claims



A device for electrostatically charging or discharging surfaces of a web or sheet material or charging photoconductive insulating layers comprising two mounted rows of needles which are separated from one another but parallel to one another with each row being of a different electrical potential. Within each row the distance between adjacent needles remains constant. Furthermore each needle of one row is coordinated at an acute angle with a needle of the other row by separating walls extending from one row of needles to the other row of needles. The angle between coordinated needles is below 45°. The needle distance is about three needle thicknesses with the needle thickness ranging between about 0.1 to 1 mm. Preferably the device includes a counterelectrode having an electrical potential equal to one row of needles.

3,792,313

TIMING CONTROL CIRCUIT FOR SOLID STATE PROTECTIVE RELAYS FOR PROVIDING NOVEL CONTROL OF THE PICKUP AND TIMING CIRCUITS PROVIDED THEREIN

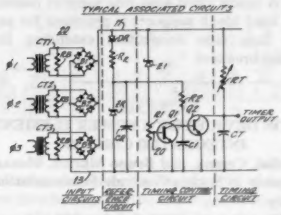
Richard Conrad, Levittown, Pa., assignor to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed Oct. 2, 1972, Ser. No. 293,913

Int. Cl. H02h *3/08*

U.S. Cl. 317—27 R 4 Claims

A static relay having sensing, reference, pickup and timing circuits and comprising a novel timing control circuit. The pickup circuit functions to initiate operation of the timing circuit when a predetermined threshold level of overload conditions exist. The novel timing control circuit functions to prevent the timing circuit from being reset due to momentary dips below the aforesaid threshold level while providing means for rapid reset of the timing control circuit when the input being monitored remains below the threshold.



3,792,314

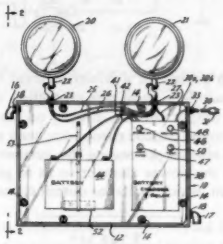
EMERGENCY LIGHT APPARATUS

J. Michael Epstein, 4730 Briarbend, Houston, Tex., and Robert B. Sisson, 5406 Starling, Houston, Tex.

Filed May 30, 1972, Ser. No. 257,855

Int. Cl. H02j *9/00*

U.S. Cl. 307—66 6 Claims



Emergency light apparatus including a sealed, non-corrosive housing for control elements and battery elements, and having fail-safe lighting elements mounted therein. The front of the housing is transparent. Testing of the apparatus may be accomplished without opening of the housing, so that the internal components will remain protected.

3,792,315

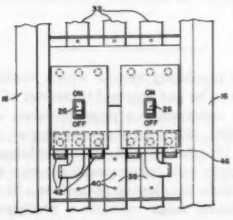
METAL ENCLOSED SWITCHGEAR WITH SANDWICHED LOAD BLOCK SUPPORTS

John G. Salvati; Louis N. Ricci, both of Beaver Falls, and Dominic Colista, Ambridge, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 1, 1973, Ser. No. 337,244

Int. Cl. H02b *1/04*

U.S. Cl. 317—112 6 Claims



Each section of a three-phase metal enclosed switchgear unit or assembly is provided with main through horizontal bus

conductors and vertical risers or section bus. The front portion of each switchgear section is divided into a plurality of stacked enclosures in which single or dual circuit breakers can be mounted. A sandwiched load side support assembly using two identical load block supports is provided for positioning and bracing load side connectors extending from dual mounted circuit breakers.

3,792,316

PROTECTION DEVICE FOR A POWER ELEMENT OF AN INTEGRATED CIRCUIT

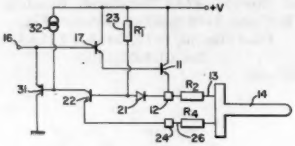
Arnaldo Bondini, Cesena, and Bruno Murari, Monza, both of Italy, assignors to Societa'Generale Semiconduttori S.p.A., Milano, Italy

Filed Oct. 18, 1972, Ser. No. 298,676

Claims priority, application Italy, May 15, 1972, 68512 A/72

Int. Cl. H02h *9/02, 9/04*

U.S. Cl. 317—31 **8 Claims**



A protection device for a power element of an integrated circuit. The main feature of this protection device is that of measuring the output current, directly on the calibrated wire of connection to the outside rheophore; such wire being inside the integrated circuit, processing the current and the output voltage across the power element so as to give a signal to a threshold circuit, which limits the output current.

3,792,317

ELECTRICAL REGULATING SYSTEM

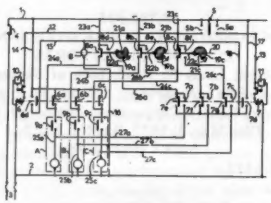
Maurice Laks, 61, Avenue Henri Barbusse, Gagny, France

Filed Dec. 18, 1972, Ser. No. 316,040

Claims priority, application France, Dec. 20, 1971, 7145692

Int. Cl. G05b *13/02*

U.S. Cl. 317—157 **4 Claims**



An electrical regulating system which enables *n* energy-generating units to be put into and taken out of service in dependence upon variations in a physical value, with permutation of these units, this system comprising an apparatus for controlling the aforementioned value combined with a double-pole contactor with three positions, one of which is a neutral intermediate position, so as to close a first circuit when the aforementioned value exceeds a predetermined upper limit, and to close a second circuit when the value falls below a predetermined limit, distinguished by the fact that it comprises a first relay and a second relay whose windings are incorporated in the first circuit and in the second circuit, respectively, and a programmer with *n* cams driven integrally by a single motor, these cams, associated with as many contact sets, becoming operative one after the other for positions of the programmer staggered angularly by 360°/*n*, each of them only remaining operative during an angular displacement of less than this value, and further by the fact that each relay comprises a contact which, when the winding of this relay is excited, causes the motor of the programmer to be fed with current, and a set of *n* contacts respectively associated with the various units and combined in such a way that, with those of the programmer, they control the entry into service of the aforementioned units, in the case of the second relay, and their removal from service in the case of the first relay.

3,792,318

COOLING APPARATUS FOR FLAT SEMICONDUCTORS USING ONE OR MORE HEAT PIPES

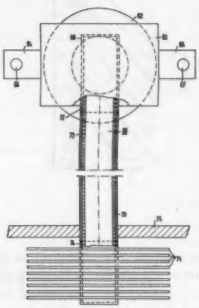
Paul Fries, Erlangen, and Konrad Moritz, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Jan. 30, 1973, Ser. No. 328,028

Claims priority, application Germany, Feb. 1, 1972, 2204589

Int. Cl. H01l *3/00, 5/00*

U.S. Cl. 317—234 R **10 Claims**



An improved cooling apparatus for flat semiconductors in which the semiconductor is held between two base members each having one or more heat pipes inserted in holes formed therein. Heat is conducted by the vaporized working fluid in the heat pipe from the end inserted into the base member to other end which contains cooling fins which condense the vapor, which in liquid form then returns by capillary action through a wick.

Also shown is an embodiment which permits locating the cooling fins remote from the semiconductor to take advantage of more favorable cooling conditions.

3,792,319

POLY-CRYSTALLINE SILICON FUSIBLE LINKS FOR PROGRAMMABLE READ-ONLY MEMORIES

Frederick Tsang, Santa Clara, Calif., assignor to Intel Corporation, Santa Clara, Calif.

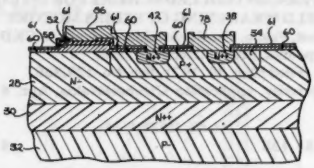
Filed Jan. 19, 1972, Ser. No. 218,988

Int. Cl. H01l *11/00, 15/00*

U.S. Cl. 317—235 R **5 Claims**

Programmable read-only circuits (e.g., memories) using doped polycrystalline silicon fusible links deposited to the top surface of an insulating (e.g., silicon oxide) layer over an integrated circuit and connected in circuit through windows in the insulating layer and/or by a metallization layer. The fusible link may be covered with a protective oxide layer which may be a perforated-like layer in the region of the fusible links to

aid in the fusing thereof. The polycrystalline fusible links do not require a corresponding portion of the substrate area and are more easily fabricated and subsequently fused than prior art devices because the manufacturing processing for the fusible link is very similar to the manufacturing process for the



rest of the semiconductor memory and the insulating layer provides a substantial thermal isolation between a fusible link and the substrate therebelow during fusing. The term "-fusible" as employed herein refers to electrical energization of electrically continuous links resulting in said link becoming discontinuous electrically.

3,792,320

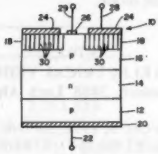
SEMICONDUCTOR SWITCH DEVICES HAVING IMPROVED SHORTED EMITTER CONFIGURATIONS

Jerald L. Hutson, 901 Newberry, Richardson, Tex.

Filed May 22, 1972, Ser. No. 255,449

Int. Cl. H01l *13/00*

U.S. Cl. 317—235 R **12 Claims**



The specification discloses a semiconductor body including a plurality of semiconductor layers of one conductivity type interleaved with layers of the opposite conductivity type to form a plurality of P-N junctions. Electrodes are connected to ones of the semiconductor layers to form a semiconductor switching device. An array of closely spaced apart shorting columns of one conductivity type extend from an interior P-N junction through an outer semiconductor layer having the opposite conductivity type. The shorting columns are spaced apart over substantially the entire area of the outer semiconductor layer to enhance the commutating and static dv/dt of the device and to enable the device to be utilized for higher frequency applications and with higher inductive loads. The specification discloses the use of the shorting column arrays for asymmetrical regenerative switches and for symmetrical semiconductor switches such as the triac.

3,792,321

PIEZOELECTRIC SEMICONDUCTOR DEVICES IN WHICH SOUND ENERGY INCREASES THE BREAKDOWN VOLTAGE AND POWER OF CAPABILITIES

Franz Seifert, Neuwaldeggerstrasse 47, Vienna, Austria

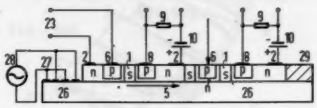
Filed Aug. 22, 1972, Ser. No. 282,766

Claims priority, application Austria, Aug. 26, 1971, 7492; Dec. 31, 1971, 11305

Int. Cl. H01l *11/00, 15/00*

U.S. Cl. 317—235 R **15 Claims**

This invention relates to electronic devices including a semiconductor member wherein charge carriers in addition to those present at thermal equilibrium of the semiconductor are injected into the semiconductor and are transported by means



of controlled sound waves for the purpose of controlling, amplifying or distributing electrical charges or for converting optical images into electrical signals.

3,792,322

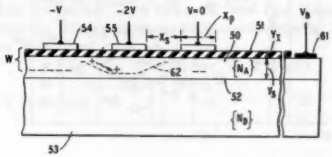
BURIED CHANNEL CHARGE COUPLED DEVICES

Willard Sterling Boyle, 1 Magnolia Pl., Summit, N.J., and George Elwood Smith, 65 Summit Rd., Murray Hill, N.J.

Continuation-in-part of Ser. No. 131,722, April 6, 1971, abandoned. This application Apr. 19, 1973, Ser. No. 352,513

Int. Cl. H01l *11/14*

U.S. Cl. 317—235 R **11 Claims**



The specification describes charge coupled devices in which the storage layer is internally charged so that the energy level profile across the thickness of the layer has a maxima in the middle of the layer. Injected carriers can then be stored and transferred in the bulk region of the semiconductor. If the energy level of the maxima exceeds the surface energy of the valence band by an amount exceeding the Boltzmann expression for thermal excitation, then the stored carriers remain isolated (statistically) from the surface states. The storage layer can be appropriately charged by biasing the layer to remove the mobile carriers. Residual fixed charge bends the energy band if the boundaries are fixed to appropriate barriers. The most convenient structure appears to be a large area *p-n* junction for the lower (buried) barrier with the usual MIS surface barrier. An MISIM structure is predictably similar. Multichannel structures are proposed such as N-P-N-P-N in which the isolated P-channels serve simultaneously as storage layers. Simultaneous use of both channels with controlled interconnection suggests many potential applications for logic circuits and the availability of convenient crossovers.

3,792,323

WOUND CAPACITOR

Robert Michael Stockman, Danbury, Conn., assignor to American Radionic Co., Inc., Danbury, Conn.

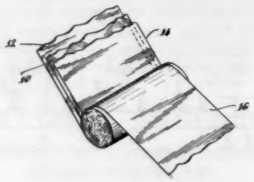
Filed May 14, 1973, Ser. No. 360,056

Int. Cl. H01g *1/14*

U.S. Cl. 317—260 **9 Claims**

There is disclosed a wound capacitor which is designed to open an external circuit upon capacitor failure. This is accomplished by dividing the foil at each end of the capacitor into

two regions. A lead is then connected to each region so that the completed capacitor has a total of four leads. The two



leads at each end of the capacitor become a part of the external circuit. A capacitor failure thereby causes an open in the external circuit.

3,792,324

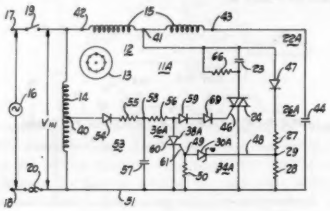
SINGLE PHASE MOTOR STARTING CIRCUIT

Julio F. Suarez, Chagrin Falls, Ohio, and Boris Mokrytzki, Murrysville, Pa., assignors to Reliance Electric Company, Cleveland, Ohio

Filed Oct. 30, 1972, Ser. No. 302,343

Int. Cl. H02p *1/44*

U.S. Cl. 318—221 E **19 Claims**



A single phase motor is started by energizing the main winding and also energizing the starting winding through a bidirectional solid state switch. A condition of the starting winding circuit is sensed such as current or voltage and compared with a reference means and when the sensing signal exceeds the reference means, the conduction through the solid state switch is terminated and remains terminated until the motor is deenergized. The foregoing abstract is merely a resume of one general application, is not a complete discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

3,792,325

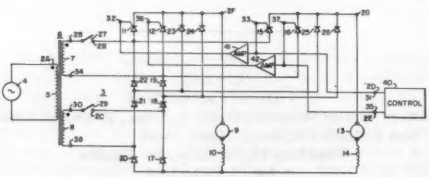
THYRISTOR CONTROL FOR A PLURALITY OF MOTORS

Karl W. Berger, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 30, 1973, Ser. No. 346,550

Int. Cl. H02p *5/12*

U.S. Cl. 318—79 **8 Claims**



A plurality of motors, such as traction motors, are provided voltage from at least one voltage source. In the thyristor control circuit, a given thyristor provides current to a load, for example at least one motor, having a current capacity no greater than the current capacity of the given thyristor.

3,792,326

CHOPPER-CONTROLLED SCHEME FOR INFINITE FIELD WEAKENING OF SERIES MOTORS

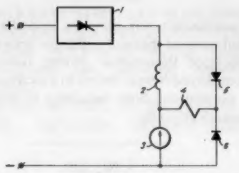
Antonin First, Praha, Czechoslovakia, assignor to CKD Praha, oborovy podnik, Praha, Czechoslovakia

Filed Mar. 30, 1971, Ser. No. 129,366

Claims priority, application Czechoslovakia, Apr. 6, 1970, 2278-70

Int. Cl. H02k *5/16*

U.S. Cl. 318—138 **9 Claims**



Circuit arrangement for starting and controlling the running of series connected motors comprising a chopper circuit, and a blocking diode arranged serially with the motor and a source of current. The blocking diode is connected to one pole of the field winding and arranged conductively for running current. A resistor shunts the diode.

3,792,327

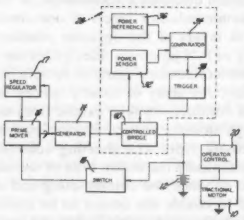
HYBRID ELECTRICAL VEHICLE DRIVE

Lindsey Earl Waldorf, 3888 Loch Alpine Dr., Ann Arbor, Mich.

Filed Oct. 5, 1972, Ser. No. 295,052

Int. Cl. H02p *5/16*; **B60l** *11/02*

U.S. Cl. 318—139 **12 Claims**

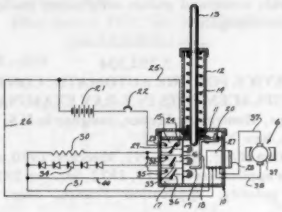


A vehicle electric drive is provided including a traction motor powered by a battery or, alternatively, by a constant power generator. When the voltage on the battery is above a first predetermined level the battery alone supplies electric power to the motor. When the battery voltage falls below a second predetermined level, a switch sensing the battery voltage starts an internal combustion engine to drive the generator; the power from the generator is effective to supply the traction motor and, simultaneously, recharge the battery. The recharging power applied to the battery equals the difference between the fixed power from the generator and the variable power to the traction motor. When the engine is running, it operates under the constant load of the generator; the engine is also operated at a constant speed. This constant speed-constant load engine operation permits the engine to be designed and adjusted to minimize exhaust pollutants.

3,792,328
D.C. MOTOR SPEED CONTROL

Leonard T. Wołoszyk, Greendale, Wis., assignor to Lakeside Manufacturing Inc., Milwaukee, Wis.

Filed Feb. 23, 1973, Ser. No. 335,054
Int. Cl. H02p *5/06*
U.S. Cl. 318—139 **10 Claims**

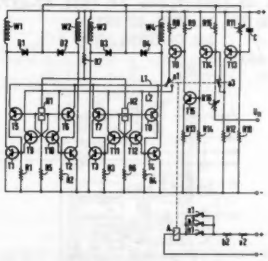


A speed control for a D.C. motor has a resistance connectable in series with an energy source and the motor armature for starting the motor, a series of voltage dropping diodes connectable in parallel with the resistance for slow speed operation, and switching connections for effectively removing the resistance and the diodes from the armature circuit for high speed operation. Dynamic braking of the motor is also provided when the motor armature is disconnected from the energy source.

3,792,329
SPINNING TURBINE HAVING SPEED-CONTROLLED BRAKEABLE ELECTRIC DRIVE MOTOR

Hans Kuhnlein, Grossgrundlach, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Jan. 19, 1972, Ser. No. 218,957
Claims priority, application Germany, Feb. 13, 1971, 2106898
Int. Cl. H02p *3/20*
U.S. Cl. 318—210 **6 Claims**

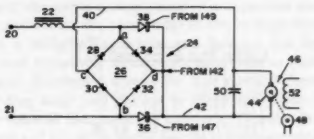


A spinning turbine has a speed-controlled brakeable electric drive motor. The drive motor is a commutatorless DC motor, the stator field of which can be reversed for braking. After the stator field is reversed, the stator current is turned off after a given speed is reached. The spinning turbine of the invention is used for the "open-end" spinning process.

3,792,330
DIRECT CURRENT MOTOR DRIVE

Allen E. Ottoson, Westboro, Mass., assignor to Vee-Arc Corporation, Westboro, Mass.

Filed Sept. 14, 1972, Ser. No. 288,900
Int. Cl. H02p *5/16*
U.S. Cl. 318—269 **7 Claims**

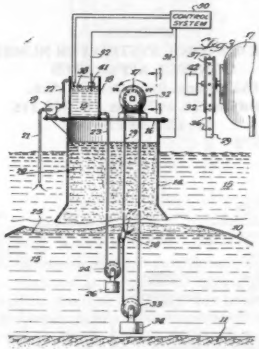


A system in which a DC motor maintains a constant preset speed under changes of load, the preset speed being variable at will. The system includes a constant-current supply, with diverter means to divert varying amounts of current from the motor circuit depending on the motor speed in comparison with a speed setting.

3,792,331
INTERFACE GAGING SYSTEM FOR UNDERWATER OIL STORAGE TANKS

Ivan Lee Wissmiller, Glen Ellyn, Ill., and Dan Haston Lundy, Huntsville, Ala., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed May 8, 1972, Ser. No. 251,053
Int. Cl. G05d *9/00*
U.S. Cl. 318—482 **8 Claims**

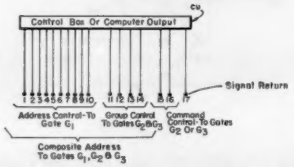


An interface gaging system for underwater oil storage tanks employs a flexible conduit through which a stream of electrically conductive seawater passes, emerging from the end of the conduit through an orifice such as a spray head or nozzle. The spray head is located in the storage tank and raised and lowered by a motor controlled by a sensing system which determines when the spray head is situated in salt water by the closiing of an electrical circuit including the stream of seawater in series with the main body of seawater. When the spray head is located in the nonconductive oil, the circuit is open rather than closed, thus activating a control which drives the spray head in the appropriate direction to seek out the interface between the oil and water phases, and to stop when it is reached. The height of the spray head above the tank bottom then represents the oil level in the vessel.

3,792,332
INTERFACE FOR MULTIPLEX MOTOR CONTROL SYSTEMS

Howard J. Fuller, Shrewsbury, Mass., assignor to Worcester Controls Corporation, West Boylston, Mass.

Filed Aug. 14, 1972, Ser. No. 280,301
Int. Cl. G05b *11/32*
U.S. Cl. 318—562 **16 Claims**

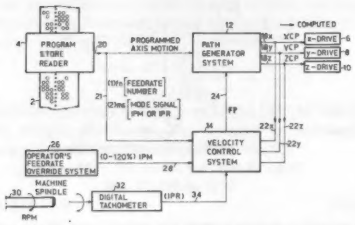

Control Box Or Computer Output
Signal Return
Address Control-To Gate G1
Group Control To Gates G2 G3
Command Control-To Gates G2 Or G3
Composite Address To Gates G1, G2 & G3

A process control interface unit comprises first, second, and third AND gates each of which has a plurality of input terminals and at least one output terminal. A computer or control box selectively energizes different ones of a plurality of parallel control lines to designate a control function to be performed. The input terminals of the first gate are coupled to selected ones of said control lines respectively; the output terminal of the first gate is coupled in parallel to an input terminal of each of the second and third gates; other selected ones of the lines are coupled in parallel to all but one of the remaining input terminals of each of the second and third gates; a further selected one of said lines is coupled to the remaining input terminal of the second gate; and a still further selected one of said lines is coupled to the remaining input terminal of said third gate. At least one controller is coupled to the output terminals of the second and third gates to perform a desired control function.

3,792,333
FEEDRATE CONTROL SYSTEM FOR NUMERICAL CONTROL APPARATUS

Hymie Cutler, 16230 Santa Rosa, Detroit, Mich.

Filed Dec. 29, 1972, Ser. No. 319,316
Int. Cl. G05b *19/24*
U.S. Cl. 318—571 **10 Claims**

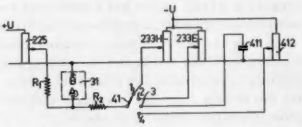


A feedrate control system for numerical control equipment comprises at least two drives having mutually orthogonal axes of motion, and apparatus for generating axis command pulses supplied to the drives to produce a resultant movement in accordance with a predetermined path and velocity programmed in a program store. The apparatus includes a path generator system operative to generate a train of axes command pulses for each axis to be supplied to the respective drives, and a velocity control system operative to compare the generated axes command pulses with feedrate command data and to produce feed pulses controlling the path generator system. The velocity control system comprises means for converting the feedrate command data to a train of feedrate command pulses; a feedrate command register; an axis command register for each axis; and an error register, two error registers being provided in a three-axis system. The system further comprises means effective upon the occurrence of each axis command pulse for adding the count of the respective axis register into the error register; means effective upon the occurrence of each feedrate command pulse for subtracting the count of the feedrate command register from the error register; and means enabling the path generator system to generate axis command pulses only when the count in the error register is negative.

3,792,334
FERRO DEVICE FOR THE AUTOMATIC CONTROL OF X-Y DISPLACEMENTS IN X-RAY EXAMINATION

Serge Rouge, Montrouge, France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 17,392, March 9, 1970, abandoned.
This application Aug. 17, 1972, Ser. No. 281,343
Claims priority, application France, Mar. 10, 1969, 69.06691
Int. Cl. G05b *19/24*
U.S. Cl. 318—579 **8 Claims**

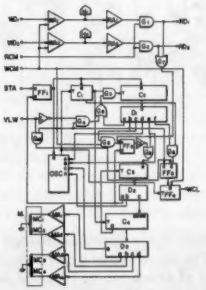


An X-ray radiating apparatus which includes an automatic device for controlling the simultaneous displacements of the radiating and recording parts of the apparatus, the device comprising a platform adapted to revolve with constant angular speed, along a diameter of which is displaced a finger driving parallelograms holding the apparatus and various coding members corresponding to the curves to be traced. The actuation of a coder determines the displacements of the finger.

3,792,335
STEPPING MOTOR CONTROLLED IN RESPONSE TO DATA FROM A TAPE

Toshio Katagiri; Tokuji Suga, both of Neyagawa; Shoji Omiya, Shijonawate, and Isamu Matsuda, Yao, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

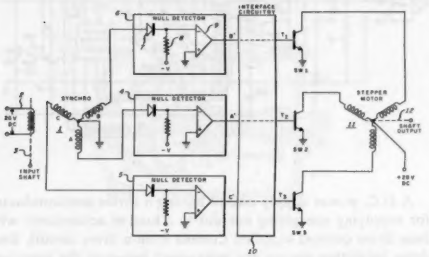
Filed Aug. 1, 1972, Ser. No. 276,931
Claims priority, application Japan, Aug. 7, 1971, 46-59675; Dec. 20, 1971, 46-120347; Dec. 24, 1971, 47-4372; Dec. 24, 1971, 47-4472; Dec. 24, 1971, 47-4672
Int. Cl. G05b *19/40*
U.S. Cl. 318—685 **8 Claims**



In a stepping data recorder which employs a stepping motor as a capstan drive motor and in which data is stored on mag-

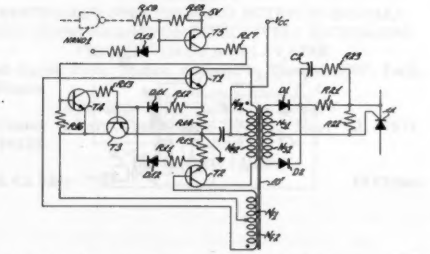
netic tape fed stepwise at a rate of several steps per piece of data, the starting and stopping characteristics are improved by appropriately driving the stepping motor so that the magnetic tape moves smoothly.

3,792,336
LINEAR TO STEP MOTION CONVERTER
Pierce C. Roselle, Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.
Filed June 4, 1971, Ser. No. 150,070
Int. Cl. G05b *11/12*
U.S. Cl. 318—696 **7 Claims**



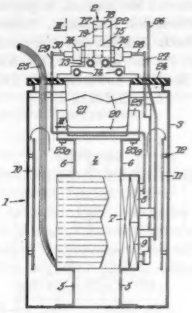
The invention comprises a conversion system for transforming an analog input signal into an incremental digital output signal. A synchro, responsive to the input analog signal provides signal nulls at specific input signal values. The signals obtained thereby are used as control signals to energize individual coils of a stepper motor. A display attached to the rotor of the stepper motor will rotate in step fashion and provide an indication of the input signal.

3,792,337
D. C. TO D. C. CONVERTER
Thomas P. Gilmore, Wauwatosa, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.
Filed Feb. 20, 1973, Ser. No. 334,151
Int. Cl. H02m *3/32*
U.S. Cl. 321—2 **15 Claims**



A D.C. to D.C. converter has a transformer with a magnetic core which is not of square loop material, a control transistor between the midtap of the transformer feedback winding and the grounded emitters of the first and second switching transistors for completing base drive circuits thereto, a current limit emitter resistor for each switching transistor, and a diode for coupling the voltage developed across the emitter resistor to the base of the control transistor. When the converter is oscillating and the core approaches saturation, a spike of current is generated which flows through the emitter resistor of the conducting switching transistor and develops a voltage which biases the control transistor off to thereby remove base drive to the switching transistors. The resulting decay in flux in the core reverses the polarity of base drive to the switching transistors. In a preferred embodiment for generating an SCR firing signal, a full wave rectifier is connected to the transformer output winding, a voltage divider is connected across the rectifier output, the voltage developed across a first portion of the voltage divider may be coupled to the SCR gating circuit, and the series arrangement of a capacitor and resistor is connected across the remainder of the voltage divider. The capacitor is initially discharged and forms a low impedance shunt to said remainder of the voltage divider so that the SCR firing signal developed across the first portion thereof has a steep leading edge and decays in magnitude with time to a constant value as the capacitor changes, whereby the average power rating of the SCR gating circuit is not exceeded.

3,792,338
SELF-CONTAINED TRANSFORMER-RECTIFIER ASSEMBLY
Louis Barthelemy, Maisons-Laffitte, France, assignor to Societe Industrielle Nouvelle De Fabrication Pour L'Automobile Et Le Cycle S.I.N.F.A.C., Courbevoise, France
Filed May 31, 1972, Ser. No. 258,368
Claims priority, application France, June 8, 1971, 7120736; Apr. 13, 1972, 7213050
Int. Cl. H01f *27/12;* **H02m** *7/00*
U.S. Cl. 321—8 C **16 Claims**

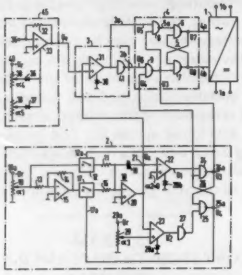


A self-contained transformer-rectifier assembly comprises a transformer received in a tank filled with oil. A massive heat sink mounted on the tank has fins which project downwardly into the oil. An electrically insulating coolant such as water is circulated in passages formed in the portion of the heat sink which is out of the tank. Solid-state rectifier elements, such as silicon diodes, are carried by the heat sink.

3,792,339
CONTROL DEVICE FOR AN INVERTED CONVERTER
Christian Kublick, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany
Filed Mar. 12, 1973, Ser. No. 340,074
Claims priority, application Germany, Mar. 16, 1972, 2212791
Int. Cl. H02m *7/00*
U.S. Cl. 321—18 **13 Claims**

This invention is an improved control device for an inverted converter. Pulses for the control of the inverted converter are derived from a sawtooth voltage produced by a sawtooth voltage generator. The sawtooth voltage generator also produces auxiliary pulses, which represent the time of the reversal

points of the sawtooth voltage. The duration between reversal points corresponds to a half-period of the sawtooth voltage. These auxiliary pulses and pulses derived from the sawtooth voltage generator by a comparator stage are applied to a switching circuit having a memory stage. The switching circuit



produces at its output pulse trains containing only one pulse per period of the sawtooth voltage. By means of the control device according to this invention, interruptions in the pulse train supplied to the inverted converter due to sudden changes in the voltage supply are avoided.

3,792,340

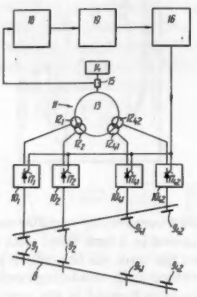
METHOD OF AND APPARATUS FOR CONTROLLING THE PERFORMANCE OF A D.C. MAGNETOHYDRODYNAMIC GENERATOR

Vladislav Solomonovich Sheinkman, Angarskaya ulitsa, 61, kv. 18; Sergei Illarionovich Pischikov, Angarskaya ulitsa, 61, kv. 20, and Boris Nikolaevich Sergeenkov, Federativny prospekt, 42, kv. 10, all of Moscow, U.S.S.R.

Filed Sept. 27, 1972, Ser. No. 292,805

Int. Cl. H02k *45/00*

U.S. Cl. 322—7 **6 Claims**



The present invention relates to a method of and an apparatus for controlling the performance of a D.C. magnetohydrodynamic (MHD) generator.

The invention consists in that the performance of the MHD-generator is controlled by means of maintaining the preset value of its electrical load factor, to which end said apparatus performs in succession three functions:

shapes a control signal to periodically vary voltages across the electrodes of the MHD-generator in a discrete manner,

determines changes of the MDH-generator active power within every time interval equal to the cycle of discrete variations of voltages across the electrodes and

shapes a control signal according to the active power change within said time interval to vary voltages across the electrodes of the MDH-generator so as to maintain the preset electrical load factor.

3,792,341

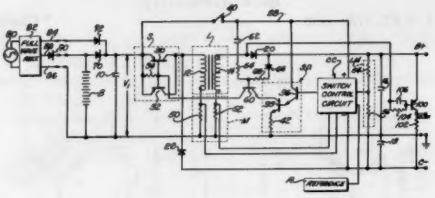
POWER SUPPLY CIRCUITRY HAVING BASE DRIVE INHIBIT CONTROL

Robert Clarence Kime, Jr., Fairview Park, Ohio, assignor to Keithley Instruments, Inc., Solon, Ohio

Filed Dec. 22, 1971, Ser. No. 210,908

Int. Cl. G05f *1/58*

U.S. Cl. 323—22 T **5 Claims**



A D.C. power supply circuit having a series semiconductor for supplying energizing current to a load in accordance with base drive current supplied thereto from a drive circuit. Base drive inhibiting means are interposed between the semiconductor and the base drive circuit for inhibiting base drive current as the output voltage decreases in magnitude below a desired level. Circuitry is also employed for controlling the drive means to alternately turn on and turn off the semiconductor means acting as a series switch in a switching regulator circuit, and output circuitry serves for providing clock pulses at a frequency dependent upon the switching frequency of the semiconductor means.

3,792,342

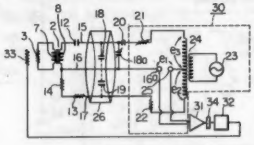
APPARATUS FOR MEASURING THE RESISTANCE OF A VARIABLE RESISTANCE ELEMENT LOCATED IN A ROTATING BODY

Shozo Ogawa, Otsu; Kiyoshi Ametani, Tokyo, and Kenro Samejima, Takatsuki, all of Japan, assignors to Toray Engineering Co. Ltd., Osaka, Japan

Filed Sept. 8, 1972, Ser. No. 287,529

Int. Cl. G05d *23/00*

U.S. Cl. 323—68 **29 Claims**



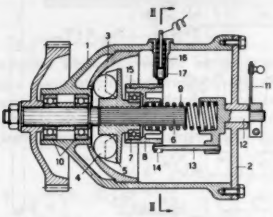
Characteristic features in the apparatus according to the invention mainly consist of improvement of a rotary transformer, a bridge circuit and a detecting means. With these features the measurement of the value of the resistance of a variable resistance element provided in a rotating body can be carried out with a high degree of accuracy independent of the effect of leakage impedance or temperature variation of the rotary transformer. Further, the above-mentioned measurement is carried out easily, and with both high reliability and interchangeability. Also, the control of a plurality of heat rollers utilized in the apparatus can be easily carried out with a central controlling apparatus.

3,792,343

REGULATOR BASED ON THE CONTROL OF A MEMBER HAVING VARIABLE IMPEDANCE SURFACE-CHARACTERISTICS, PARTICULARLY FOR FEED ADJUSTMENT IN I.C. ENGINES

Gian Paolo Garcea, Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 856,432, Sept. 9, 1969, abandoned. This application May 24, 1972, Ser. No. 256,511
Claims priority, application Italy, Sept. 14, 1968, 21257/68
Int. Cl. H01c 7/00
U.S. Cl. 323—82 8 Claims



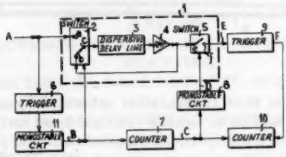
A regulator, particularly for an internal combustion engine, includes a member with variable impedance surface characteristics, contacted by a tracer element. The member has such a material composition and distribution at its surface as to feature a varying impedance characteristic across its surface layer, the varying impedance characteristic representing the value of a function of two independently varying physical quantitites. The regulator has means to impart relative displacement between the member and the tracer element, in two different directions of the surface of the member, the magnitudes of the displacements being respectively proportional to the two independently varying physical quantities. The tracer element and the member are connected as part of an indicating circuit which senses the varying impedance characteristic depending on the changing point of contact betwen the tracer element and the member to give an output signal proportional to the value of the known function of the two independently varying physical quantities.

3,792,344

SYSTEM FOR PROCESSING ELECTRICAL SIGNALS INCLUDING MEANS FOR EFFECTIVELY INCREASING THE LENGTH OF A DELAY LINE

Joel Guyot, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Mar. 20, 1972, Ser. No. 236,099
Claims priority, application France, Mar. 23, 1971, 7110135
Int. Cl. G01r 23/02
U.S. Cl. 324—77 D 10 Claims



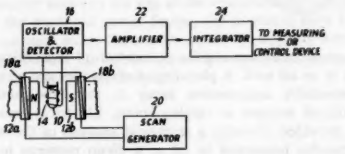
A system for processing electrical signals in different ways operating on the theory of an artificial increase in the length of a dispersive delay line. The system comprises a dispersive circuit having a controlled input switch for partially injecting a signal into a dispersive line and connecting the output of the delay line to its input to circulate the injected signal. An output switch connects the delay line to a load. A rhythm generator controls the input and output switches in order that the signal being processed circulates *n* times through the line prior to application to the load circuit.

3,792,345

CHECKING AND CALIBRATION OF APPARATUS INCORPORATING A RESONANT CIRCUIT

Francis Hawkins, Newport Pagnell, England, assignor to Newport Instruments Limited, Newport, Pagnell, England

Filed Apr. 14, 1972, Ser. No. 244,089
Claims priority, application Great Britain, Apr. 16, 1971, 9628/71
Int. Cl. G01n 27/78
U.S. Cl. 324—.5 R 11 Claims



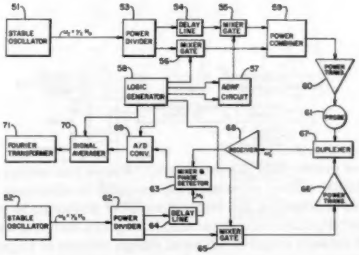
In the use of spectrometric apparatus incorporating a resonant circuit an artificial signal is generated for checking, calibration or measurement purposes. The artificial signal is generated by periodically switching a resistance into and out of circuit with the resonant circuit, preferably also biasing out the normal resonance signals. It is particularly applicable to the monitoring of on-line flow systems.

3,792,346

PROTON-ENHANCED NUCLEAR INDUCTION SPECTROSCOPY

Michael G. Gibby, Arlington, Va.; Alexander Pines, Berkeley, Calif., and John S. Waugh, Lincoln, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Nov. 20, 1972, Ser. No. 308,212
Int. Cl. G01n 27/78
U.S. Cl. 324—0.5 R 31 Claims



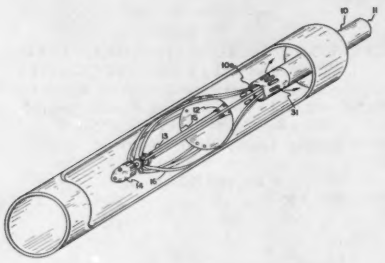
A method is described for the detection of the natural magnetic and/or electric quadrupole reasonance frequencies of isotopically rare or chemically dilute nuclei in the presence of at least one abundant nuclear spin species. The free induction decay of the dilute nuclei is directly detected after an applied r.f. field at the Larmor frequency of the dilute nuclei is removed. A high resolution spectrum of the dilute nuclei is obtained by applying an r.f. field at the Larmor frequency of the abundant spin system during the detection interval.

3,792,347

OIL WELL TOOL FOR MEASURING PERCENT OIL

Jack S. Hawley, 925 Delaware, Berkeley, Calif.

Filed May 17, 1972, Ser. No. 254,175
Int. Cl. G01n *27/42*; G01v *3/00*
U.S. Cl. 324—30 R 8 Claims



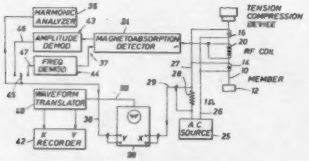
A tool for measuring the percent of oil in an oil/water mixture in an oil well. A plurality of electrodes are arranged in a substantially coextensive array in the flow path of the produced mixture at varying levels. Electrical arrangements are provided whereby a statistical analysis of the number of electrodes immersed in oil at a given moment may be integrated on a go-no go basis, the electrodes being either insulated when in oil or conducting to ground when in water. The number of electrodes so insulated by oil droplets being converted into an analogous electrical signal. Errors due to variations in the resistance and galvanic offset voltage in the water are compensated for.

3,792,348

METHOD OF DETERMINING STRESS IN A FERROMAGNETIC MEMBER USING MAGNETOABSORPTION

William L. Rollwitz, 213 Halbert Cir., San Antonio, Tex.; John Arambula, Rural Rt. No. 3, Austin, Tex., and John P. Claassen, 5800 Thames Dr., Lawrence, Kans.

Continuation-in-part of Ser. No. 64,620, Aug. 17, 1970, abandoned, which is a continuation of Ser. No. 654,800, July 20, 1967, abandoned. This application Nov. 19, 1971, Ser. No. 200,548
Int. Cl. G01r *33/12*
U.S. Cl. 324—34 ST 3 Claims



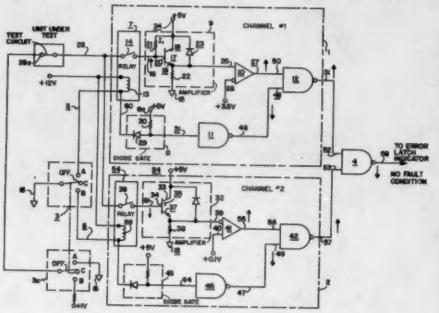
Magnetoabsorption apparatus for indicating changes in stress in ferrous materials and nonferrous materials including a ferrous film joined thereto, an inductively coupled radio frequency field coupled to the ferrous material, a means for applying the field in a manner to use the reversible relative permeability as a function of the stress in the member, the stress being indicated by use of a magnetoabsorption detector calibrated in stress units, and indicative of the direction, amplitude, and type of stress.

3,792,349

DUAL CHANNEL, DUAL POTENTIAL OPEN-CIRCUIT TEST APPARATUS

Charles R. Bobbitt, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Oct. 25, 1972, Ser. No. 300,605
Int. Cl. G01r *31/02*
U.S. Cl. 324—51 3 Claims



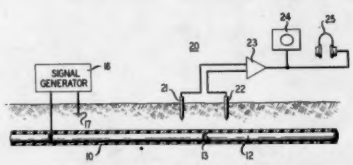
A detector network for the indentification of discontinuities in integrated circuit lead connections in the presence of two different potentials such as positive or negative test pulses or different steady state voltages.

3,792,350

DETECTION OF METALSHIELD FAULTS IN BURIED CABLE

Fred Christian Bossler, Union, and William Harold Kent, Jr., Berkeley Heights, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 15, 1972, Ser. No. 234,800
Int. Cl. G01r *31/08*
U.S. Cl. 324—52 3 Claims



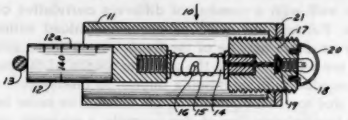
The electric field configuration generated by exciting a cable shield with an ac signal is detected by an earth prod in directions that are respectively perpendicular and parallel to the cable axis with respect to a ground plane. The field components in the vicinity of an open in the shield exhibit characteristic changes that are extensive and readily detectable with conventional amplifying equipment. Cable locating methodology is also disclosed.

3,792,351

ABSORPTION FREQUENCY METER HAVING SHIELDED INDUCTOR

Frank E. Ireland, 7425 S.W. 34th Street Rd., Miami, Fla.

Filed Mar. 10, 1972, Ser. No. 233,409
Int. Cl. G01r 23/00
U.S. Cl. 324—81 10 Claims



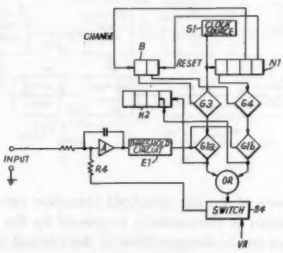
An absorption frequency meter having a high-Q circuit comprising a resonant circuit having variably adjustable concentric capacitive plates, electrically in series with an inductance means and an indicating means, said capacitive plates providing electromagnetic shielding for said inductance means.

3,792,352

ANALOG-TO-DIGITAL CONVERTER UTILIZING DIFFERENT FEEDBACK EFFECTS TO OBTAIN ACCURACY AND RESOLUTION

Eric Metcalf, and Howard Anthony Dorey, both of Fainborough, England, assignors to The Solartron Electric Group Limited, Farnborough, England

Division of Ser. No. 495,071, Oct. 12, 1965, abandoned. This application Sept. 10, 1970, Ser. No. 71,263
Int. Cl. G01r 17/06, 1/00, 19/26
U.S. Cl. 324—99 D 4 Claims



An analog-to-digital converter provides improved resolution without attendant loss of accuracy or speed of operation over known converters. This is achieved by providing slow-acting feedback to the integrating circuit for increasing resolution. The fast-acting feedback consists of quanta of charge of defined magnitude and the slow-acting feedback is derived from the fast feedback either by smoothing or by reducing the frequency of the quanta.

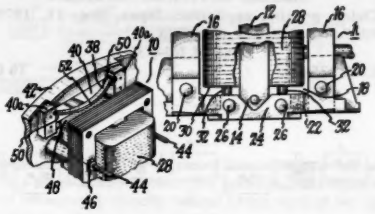
3,792,353

INDUCTION WATTHOUR METER POTENTIAL COIL MOUNTING

Alexander Loika, Jr., Somersworth, N.H., assignor to General Electric Company

Filed Aug. 23, 1972, Ser. No. 283,195
Int. Cl. G01r 11/02
U.S. Cl. 324—137 4 Claims

The potential coil of an induction watthour meter is encapsulated in an electrically insulating resinous material and mounted on the winding leg of the potential electromagnetic or core of the meter. The lower end of the encapsulated coil which is closest to the voltage pole face is provided with plastic bosses which contact the bottom pole piece of the potential core. The upper end of the coil is movably held by a



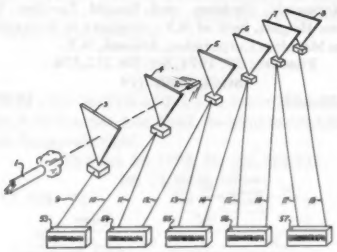
spring member between the top of the encapsulated coil and a recess in the watthour meter frame, the potential core being mounted on such meter frame. Alternatively, a spring member is mounted on the top of the potential core pressing against the top of the encapsulated coil.

3,792,354

VELOCITY MEASURING SYSTEM

William Francis Slaght, Courcelette, Quebec, Canada, and Julien F. Boutin, Lake Worth, Fla., assignors to Her Majesty the Queen in right of Canada as represented by the Minister of National Defence

Filed Feb. 4, 1972, Ser. No. 223,669
Int. Cl. G01p 3/66
U.S. Cl. 324—178 9 Claims



A system and method for determining the relative velocities of a projectile at different portions of its path in which a plurality of signalling detector stations are arranged at predetermined intervals along such path, a common receiving station is arranged to receive signals from the detector stations through a common communication channel and has a memory unit capable of storing pulses corresponding to the signals received, and a calculator capable of analyzing adjacent pairs of the pulses which have been produced by passage of the projectile over two or more of the path intervals monitored by the detector stations to determine the relative velocities of the projectile as it traverses the path intervals monitored by different pairs of detector stations. This information is valuable for example in studying retardation properties of a projectile.

3,792,355
ORTHOGONAL TRANSFORMATION CIRCUIT USING HADAMARD MATRICES

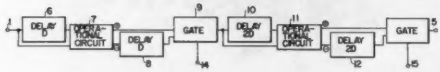
Masachika Miyata, Kodaira, and Takahiko Fukinuki, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 10, 1971, Ser. No. 206,691

Claims priority, application Japan, Dec. 11, 1970, 45-109527; May 21, 1971, 46-34008

Int. Cl. H04j *3/18*

U.S. Cl. 325—42 **16 Claims**



An orthogonal transformation circuit in which unit transformation circuits are connected in cascade in accordance with a desired order of transformation. Each unit transformation circuit comprises a first delay circuit which delays discrete signals by a fixed time, an arithmetic circuit which provides the sum and difference between input and output signals of the delay circuit, a second delay circuit which delays the difference signal of the arithmetic circuit by the same delay time as that of said first delay circuit, and a gate circuit which provides output signals such that the sum signal from the arithmetic circuit and the difference signal from the second delay circuit are alternated at a fixed time interval.

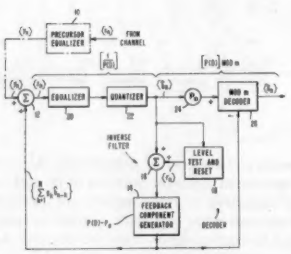
3,792,356
RECEIVER STRUCTURE FOR EQUALIZATION OF PARTIAL-RESPONSE CODED DATA

Hisashi Kobayashi, Ossining, and Donald Tao-Nan Tang, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1971, Ser. No. 212,578

Int. Cl. H04b *3/14*

U.S. Cl. 325—42 **10 Claims**



The present invention relates to a new receiver structure for the equalization of partial-response or correlative level coding systems in which the main equalizer and quantizer are embedded inside the inverse filter. The main embedded filter primarily accomplishes equalization of signal distortion in the tail portion of the received signal. According to a further aspect of the invention, a separate precursor equalizer may be utilized in front of the receiver structure in situations where the front end or precursor intersymbol interference is not negligible. According to one additional aspect of the invention where the number of precursor interference terms is small, a certain amount of precursor equalization may be included in the inverse filter portion of the main receiver structure. The receiver structure has a wide variety of applications and will function well with a number of different correlative coding schemes. Further, the main equalizer embedded within the receiver structure may be of the fixed, automatic or adaptive type as are well known in the art. The source of the correlatively encoded data containing undesired intersymbol interference due to characteristics of the channel or noise may be either a transmission line or, for example, a magnetic recording and pickup system utilizing the NRZI recording scheme.

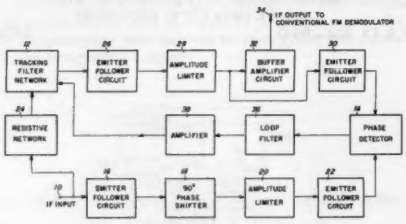
3,792,357
PRE-EMPHASIS LOOP FILTER FOR IMPROVED FM DEMODULATOR NOISE THRESHOLD PERFORMANCE

Norris C. Hekimian, 1517 Baylor Ave., Rockville, Md., and Walter Mack, 6523 32nd St., Falls Church, Va.

Continuation-in-part of Ser. No. 889,432, Dec. 31, 1969, abandoned. This application May 24, 1972, Ser. No. 256,240

Int. Cl. H04b *1/62*

U.S. Cl. 325—46 **8 Claims**



The performance of a noise threshold extension circuit for an FM demodulator is substantially improved by the incorporation of a pre-emphasis-type filter in the control loop of the circuit, which filter "matches" the frequency response characteristic of the loop to that of the modulating signal. The threshold extension circuit preferably includes a steerable, narrowband tracking filter which tracks the FM signal so that extraneous noise is filtered out.

3,792,358
SINGLE CYCLE TRANSMITTER

Edward A. Lewis, Harvard; John E. Rasmussen, Concord, both of Mass., and James R. Stahmann, Miramar, Fla., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

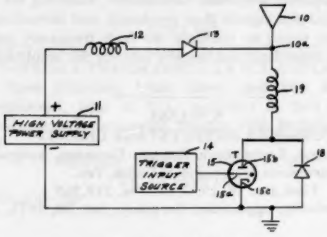
Filed Dec. 15, 1972, Ser. No. 315,745

Int. Cl. H04b *1/04*

U.S. Cl. 325—128 **2 Claims**

A single cycle transmitter at low and very low frequencies operates with an electrically short antenna. The transmitter produces an extremely short pulse of approximately one cycle

duration. In response to a trigger signal, the transmitter's thyratron directly switches the antenna driving voltage,



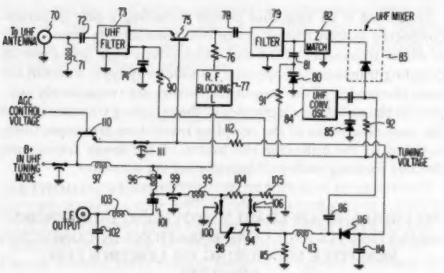
producing the first half cycle of a radiation pulse. The second half cycle is produced when diodes conduct. During this time, the thyratron deionizes, cutting off radiation.

3,792,359

HIGH FREQUENCY AUTOMATIC GAIN CONTROL CIRCUITS

David John Carlson, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 14, 1971, Ser. No. 133,806
Int. Cl. H04b *1/16, 1/18*
U.S. Cl. 325—319 **8 Claims**



A common base amplifier used for high frequency amplification has an automatic gain control voltage applied thereto to vary the gain in a reverse mode. As the gain of the transistor is decreased, a unilateral current conduction device, coupled to the emitter electrode or input of the amplifier, is caused to conduct. The conduction of the unilateral device causes the voltages between the electrodes of the amplifier to remain constant, while further causing additional impedance shunting of the transistor to maintain the input impedance of the amplifier relatively constant during AGC operation.

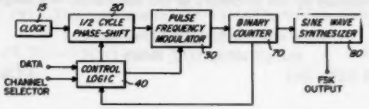
3,792,360

MULTI-FREQUENCY SIGNAL GENERATOR

Earl F. Carlow, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Aug. 14, 1972, Ser. No. 280,620
Int. Cl. H03b *19/00*
U.S. Cl. 328—14 **17 Claims**

The time taken to count up a binary counter is made adjustable by selectively phase-shifting a series of pulses passing into the counter and originating from a fixed frequency clock. The electronic pulses originating from the clock pass through a phase-shifting network, the shifting being responsive to and dependent upon digital data input in the form of electronic signals. A control circuit controls the phase-shifting network to produce a total counter cycle time that is representative of



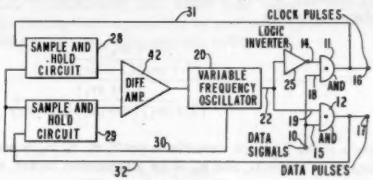
the digital data input. The output of the counter serves as an input to a sine wave synthesizer for providing an output sine wave of a frequency directly related to the state of the input digital data signal.

3,792,361

HIGH SPEED DATA SEPARATOR

Frank J. Sordello, San Jose, and Robert L. Cloke, Santa Clara, both of Calif., assignors to Itel Corporation, San Francisco, Calif.

Filed Aug. 23, 1972, Ser. No. 283,106
Int. Cl. H03k *5/153, 5/18*
U.S. Cl. 328—63 **6 Claims**



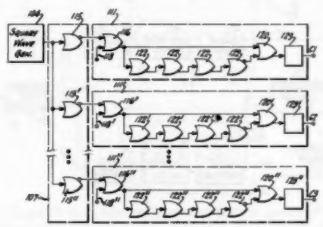
This invention involves a circuit capable of phase locking onto a data input signal for the separation of the clocking and data segments of the signal.

3,792,362

CLOCK APPARATUS AND DATA PROCESSING SYSTEM

Glenn D. Grant, San Jose, Calif., assignor to Amdahl Corporation, Sunnyvale, Calif.

Filed Oct. 30, 1972, Ser. No. 302,222
Int. Cl. H03k *5/159*
U.S. Cl. 328—72 **13 Claims**

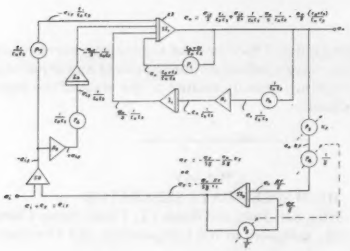


Disclosed is a clock apparatus for use in a data processing system. The clock pulse width is made substantially equal to the maximum latch delay (MLD) plus the clock skew (CS) for obtaining the minimum number of circuits relative to the maximum clock frequency.

3,792,363
CONTROLLABLE EDGE SHARPENING SYSTEM FOR TIME SEQUENTIAL SIGNALS

Radames K. H. Gebel, and Henry E. Fettis, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 26, 1972, Ser. No. 247,775
Int. Cl. H03k 5/12; H04b 1/12
U.S. Cl. 328—164 **4 Claims**



A time sequential signal having deficient leading and trailing edge characteristics is modified by a system having a third order network with a transfer function represented in the Laplace domain by

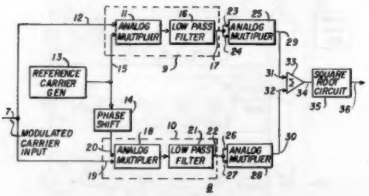
$$F_R(s)=\frac{e_o}{e_i}=\frac{\dfrac{(1+s\tau_1)}{(1+s\tau_2)(1+s\tau_3)}}{1+K_F\dfrac{(1+s\tau_1)}{(1+s\tau_2)(1+s\tau_3)(1+s\gamma)}}$$

where s is the Laplace variable in sec^{-1}, τ_1, τ_2, τ_3, γ are time constants in seconds, and K_F is an attenuation factor, with e_o being the output and e_i the input signal. This system provides an improved signal having leading and trailing edge characteristics suitable for utilization.

3,792,364
METHOD AND APPARATUS FOR DETECTING ABSOLUTE VALUE AMPLITUDE OF AM SUPPRESSED CARRIER SIGNALS

James W. Ananias, Springfield, Ill., assignor to Sangamo Electric Company, Springfield, Ill.

Filed Aug. 3, 1972, Ser. No. 277,634
Int. Cl. H03d 1/52; H04l 27/22
U.S. Cl. 329—50 **14 Claims**

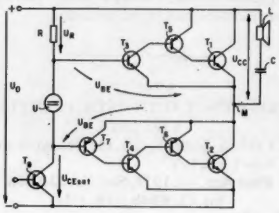


Apparatus for detecting the absolute value amplitude of amplitude modulated suppressed carriers includes first and second product detectors which use quadrature phases of a locally generated reference carrier to product detect the modulated carrier producing first and second vector components of the amplitude of the information signal, and an output circuit for obtaining the vector sum of the two components of the information signal amplitude to thereby provide a signal which is proportional to the absolute value amplitude of the information signal. In one embodiment, the vector sum of the two components of the information signal amplitude is obtained by amplitude modulating quadrature phases of a high frequency carrier in separate amplitude modulators, summing the amplitude modulated signals thus produced, and demodulating the resultant signal to translate the high frequency carrier back to the base-band and thereby recover the amplitude information.

3,792,365
PUSH-PULL OUTPUT STAGE CIRCUIT

Erich Ellbogen, Langenbach Bayern, Germany, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 18, 1972, Ser. No. 218,765
Claims priority, application Germany, Jan. 20, 1971, P 21 02 553.6
Int. Cl. H03f 3/18, 3/26
U.S. Cl. 330—15 **6 Claims**

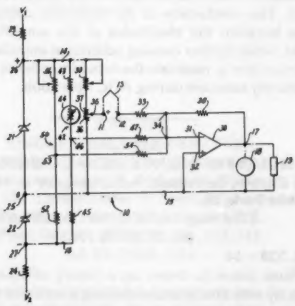


Disclosed is an amplifier circuit including a pair of series-connected output transistors of one conductivity type, a pair of driver transistors of the one conductivity type and a pair of coupling transistors of opposite conductivity type; wherein the base electrodes of the output transistors are respectively coupled to the collector electrodes of the coupling transistors, and the base electrodes of the coupling transistors are respectively coupled to the collector electrodes of the lower transistors; thereby forming push-pull branches of the amplifier.

3,792,366
METHOD AND APPARATUS PROVIDING INDEPENDENT ADJUSTMENTS AND COMPENSATIONS IN CONDITION SENSITIVE MEASURING OR CONTROLLING CIRCUITS

Eugene R. Jornod, Rockford, Ill., assignor to Barber-Colman Co., Rockford, Ill.

Filed Sept. 13, 1972, Ser. No. 288,657
Int. Cl. H03f 3/68
U.S. Cl. 330—22 **10 Claims**



Potentials, produced by independent half-bridges, are algebraically summed in various proportions with a condition

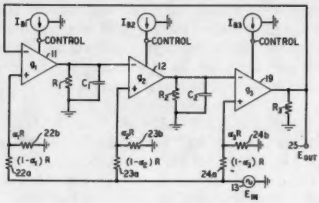
sensitive millivolt potential to provide an input to an amplifier producing an output potential as a function of the summed input potential.

3,792,367

ACTIVE CONTROLLABLE FILTER CIRCUIT USING VARIABLE TRANSCONDUCTANCE AMPLIFIER

Paul Egon Fleischer, Little Silver, and Dan Hilberman, Middletown, both of N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed May 1, 1972, Ser. No. 249,090
Int. Cl. H03f 1/24
U.S. Cl. 330—98 6 Claims



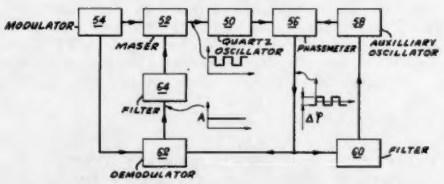
An RC active filter circuit wherein the active elements of the circuit are realized by controllable transconductance amplifiers. The transfer response of the filter circuit is readily variable by altering signals applied to the control terminals of the transconductance amplifiers.

3,792,368

METHOD OF TUNING THE OSCILLATION FREQUENCY OF THE RESONANT CAVITY OF A MASER OSCILLATOR TO THE TRANSITION FREQUENCY OF STIMULATED EMISSION OF THE ACTIVE MEDIUM OF SAID MASER

Claude Audoin, Ivry, France, assignor to Agence Nationale de Valorisation de la Recherche Anvar, Courbevoie, France

Filed Aug. 1, 1972, Ser. No. 277,079
Claims priority, application France, Aug. 6, 1971, 71.28912
Int. Cl. H03b 3/12
U.S. Cl. 331—3 8 Claims



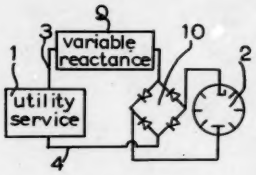
The method consists in periodically modulating the level of oscillation of the maser ; in detecting the phase variation of the maser oscillation with respect to the oscillation of a reference oscillator, namely the variation which takes place only in the event of mismatch of the resonant cavity of the maser and results from the modulation ; and in correcting the mismatch.

3,792,369

VARIABLE REACTANCE CONTROLS FOR AC POWERED HEATING MAGNETRONS

Melvin L. Levinson, 1 Meinzer St., Avenel, N.J.

Continuation-in-part of Ser. Nos. 739,778, June 25, 1968, and Ser. No. 841,507, July 14, 1969, and Ser. No. 202,314, Nov. 26, 1971. This application Sept. 13, 1972, Ser. No. 288,714
Int. Cl. H03b 9/10; H05b 9/00
U.S. Cl. 331—71 9 Claims



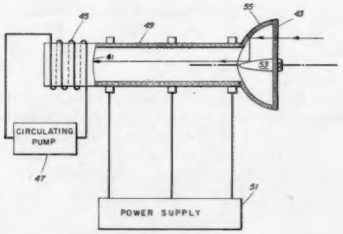
A variable reactance combined in series with a magnetron where, when said variable reactance is a variable capacitive reactance, means are provided for DC operation of said magnetron and AC operation of said capacitive reactance; where variable reactance can be a fixed reactance and variable reactance combination; and where said variable reactance provides the regulation required by said magnetron over normal voltage variations of an electric utility service.

3,792,370

IMPROVED OPTICAL CAVITY FOR A LASER

Irving Goldstein, 31 Peacock Farm Rd., Lexington, Mass., and Werner R. Rambauske, 170 Acton St., Carlisle, Mass.

Continuation of Ser. No. 203,811, Dec. 1, 1971. This application Aug. 11, 1972, Ser. No. 279,914
Int. Cl. H01s 3/08
U.S. Cl. 331—94.5 2 Claims

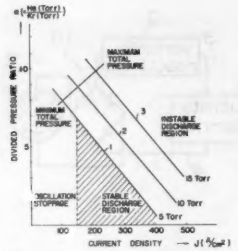


A catoptric lens arrangement which is adapted to use with high power radiant energy, as from a laser, is shown. The entrance mirror of the contemplated lens arrangement has a convex reflective surface so that the radiative flux density at the entrance mirror is less than the radiative flux density in a laser beam. The various mirrors in the contemplated lens arrangement further are arranged so that each such mirror may be conductively cooled with aperture blockage reduced to a minimum or eliminated altogether.

3,792,371
GAS LASER

Shunsuke Tomiyama; Akira Hashimoto, both of Tokyo, and Manabu Yamamoto, Odawara, all of Japan, assignors to Hitachi, Limited, Tokyo-to, Japan

Continuation-in-part of Ser. No. 832,662, June 12, 1969, abandoned. This application Oct. 22, 1971, Ser. No. 191,927
Claims priority, application Japan, June 21, 1968, 43-43290
Int. Cl. H01s *3/22, 3/09*
U.S. Cl. 331—94.5 **3 Claims**

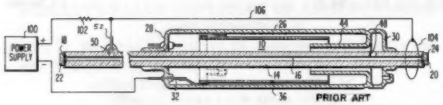


A large, continuous laser oscillation output of Kr^+II gas can be obtained by exciting a mixture gas of krypton and helium filled in a capillary discharge tube at a total mixture gas pressure of less than 10 Torr with a direct current of 150 to 400 A/cm² in current density, the mixing ratio of helium with respect to krypton being from 0.5 to 5 times as high as that of krypton, and the gas-filled discharge tube being disposed between a pair of reflectors.

3,792,372
MEANS FOR ENSURING STARTING OF GAS LASER

John Thomas Mark, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed June 12, 1972, Ser. No. 261,779
Int. Cl. H01s *3/09, 3/22*
U.S. Cl. 331—94.5 **5 Claims**



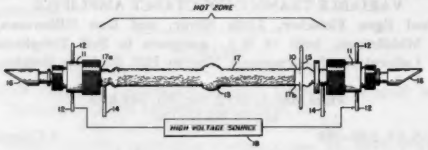
By employing a serially-connected, resistance of 20 to 500 megohms between an additional starting electrode and the anode of a gas laser tube, the starting of a discharge between the anode and cold cathode thereof is ensured without the danger of tube-destroying parasitic oscillations.

3,792,373
METALLIC VAPOR LASER ASSEMBLY

Daniel E. Altman; Glidden J. Barstow, and Myer Geller, all of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 21, 1972, Ser. No. 274,126
Int. Cl. H01s *3/02, 3/22*
U.S. Cl. 331—94.5 **7 Claims**

A metallic vapor laser assembly has an enclosed central section of tubular heat-resistant material in which a selected metallic element may be maintained in its vapor state and also in contact with an electrode at each end; the electrodes are connected to a source of electrical energy to raise the metallic vapor to a state of excitation causing laser energy emission. A first pair of suitably transmissive windows maintained at an elevated temperature, are positioned to retain the metallic vapor in the central section. A second pair of windows which may be preferably positioned at the Brewster angle, are supported outwardly along the axis of the laser energy emission

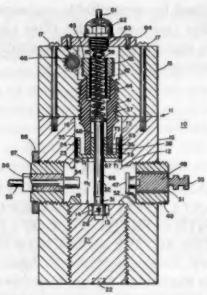


defining closed end sections which are contiguous to the closed central section; the end sections are evacuated to facilitate maintaining the second set of windows at a temperature substantially lower than the elevated temperature of the central section and the first pair of windows, and to prevent leakage of air past the inner set of windows into the enclosed central section containing the metal vapor.

3,792,374
WIDEBAND MECHANICALLY AND ELECTRONICALLY TUNED NEGATIVE RESISTANCE OSCILLATOR

Richard C. Havens, and James W. Taylor, both of Scottsdale, Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed June 26, 1972, Ser. No. 266,334
Int. Cl. H03b *7/06*
U.S. Cl. 331—107 R **10 Claims**



A wideband mechanically and electrically tunable negative resistance oscillator is disclosed wherein a low Q cavity is coupled to a high Q cavity at one end thereof by a narrow gap. A negative resistance R.F. diode is disposed in the low Q cavity in good heat conducting relationship with a massive heat sink. At the other end of the high Q cavity there is the mechanical frequency adjusting structure for tuning the high Q cavity over a wide frequency range. At one side of the high Q cavity, there is a varactor diode for electrically tuning the high Q cavity over a relatively small frequency range. At the other side of the high Q cavity there is a power take out structure.

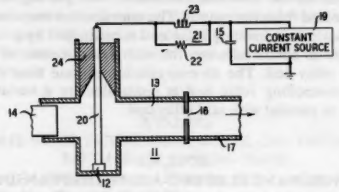
3,792,375
SUPPRESSION OF SPURIOUS BIAS CIRCUIT OSCILLATIONS IN IMPATT OSCILLATORS

Charles Arthur Brackett, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Nov. 8, 1972, Ser. No. 304,629
Int. Cl. H03b *1/04, 7/14*
U.S. Cl. 331—96 **11 Claims**

Spurious oscillations in the dc bias circuit of an Impatt oscillator are suppressed by including in the bias circuit a filter

which is external of the microwave resonator. The filter includes an inductance for shunting a dissipative resistance and



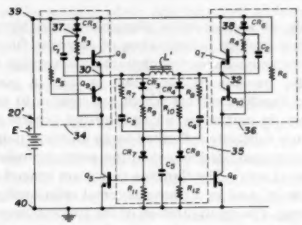
for providing a low-loss path for the dc bias current. Specific design criteria for the filter are disclosed.

3,792,376

HIGH EFFICIENCY TRANSISTOR ASTABLE MULTIVIBRATOR

Richard H. Pederson, Marshalltown, Iowa, and Robert O. Gregory, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 18, 1972, Ser. No. 245,225
Int. Cl. H03k *3/282*
U.S. Cl. 331—113 R **4 Claims**



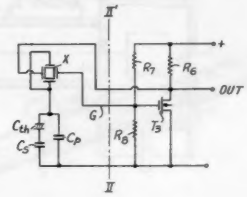
Disclosed is a high efficiency oscillator circuit for use in a field transmitter of a process control system. The oscillator includes first and second current drive output transistors cross-coupled through a load to first and second current sink transistors, respectively, and these transistors are operatively biased for astable switching so that the first output and the first current sink transistors simultaneously conduct in one state of the oscillator and the second output and the second current sink transistors simultaneously conduct in another state of the oscillator. First and second series cut-off transistors are connected, respectively, between the first and second current sink transistors and each side of the load, and these latter transistors insure that one of the output transistors is clamped off when the other output transistor is biased into conduction. Turn on drive circuitry connected to each of the output transistors includes a pair of capacitors which discharge, respectively, into the pair of output transistors to alternately drive same into saturation as the circuit is switched. As a result, pairs of output and series cut-off transistors are simultaneously biased to saturation in series across the power supply, and thereby minimize voltage drops across the power supply and maximize the operational efficiency of the circuit.

3,792,377

TEMPERATURE COMPENSATED QUARTZ OSCILLATOR CIRCUIT

Kinji Fujita, and Hiromitsu Mitsui, both of Takagi, Japan, assignors to Kabushiki Kaisha Suwa Seikasha, Tokyo, Japan

Filed Dec. 27, 1971, Ser. No. 212,269
Claims priority, application Japan, Dec. 28, 1970, 45/120055
Int. Cl. H03b *5/36*
U.S. Cl. 331—116 R **4 Claims**



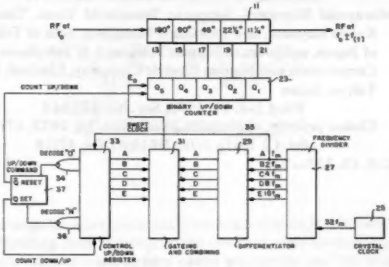
A quartz oscillator having a four-terminal quartz vibrator, two of the four terminals being connected with a compensating device for compensating the temperature coefficient of the quartz vibrator frequency, the other two terminals being connected with an active circuit including at least one MOS transistor.

3,792,378

DIGITALLY CONTROLLED RF SWEEP GENERATOR

Alexander S. Hughes, College Park, and Sidney A. Taylor, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 8, 1971, Ser. No. 178,788
Int. Cl. H03b *19/00*
U.S. Cl. 331—178 **10 Claims**

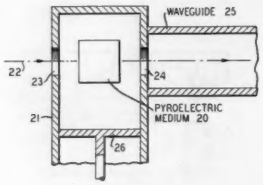


An RF signal is inputted to a digitally controlled RF phase shifter. The RF phase shifter is responsive to digital signal commands and operates to shift the phase of the RF input signal and its frequency in response to the digital signal input. The relationship between change in frequency versus change in phase over a time interval requires that the phase shift rate of change be varied parabolically for the frequency to change linearly with time. The phase change is, therefore, accomplished by parabolically incrementing the digital count, relative to time. The RF frequency is thereby linearly swept about the RF center frequency.

3,792,379
MILLIMETER WAVE DEVICES UTILIZING ELECTRICALLY POLARIZED MEDIA

David Henry Auston, Mountainside, and Alastair Malcolm Glass, Millington, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Mar. 7, 1972, Ser. No. 232,435
Int. Cl. H01s 3/10
U.S. Cl. 332—7.51 23 Claims

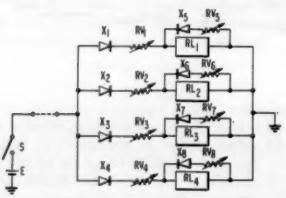


Radiative signals, e.g., pulses of duration as short as one picosecond or CW energy with frequencies as high as 10,000 GHz are radiated from pyroelectric media. Pump energy is in the form of electromagnetic radiation of wavelength within the range of one millimeter and shorter. The effect of such devices is to replicate the form of intensity variations of pump radiation whereby such variations take the form of pulses, modulation signals, difference frequencies, etc. Rapid response is, in a preferred instance, due to direct absorption of pump radiation at or below a low frequency absorption edge of a crystalline medium so that the energy is pumped directly into the lattice of the pyroelectric medium. An alternative arrangement takes advantage of the thermalization accompanying relaxation of an excited electron state. In the latter case the excited state may be that of a dopant material having an absorption within a normal transparency bandwidth of the pyroelectric medium.

3,792,380
SIGNAL SWITCHING ARRANGEMENT

Masayoshi Murotani, Sapporo; Tsunetoshi Yano, Tateyama; Kaoru Koyama, and Toshiharu Motojima, both of Tokyo, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation and Nippon Electric Company, Limited, both of Tokyo, Japan

Filed Jan. 11, 1973, Ser. No. 322,665
Claims priority, application Japan, Jan. 14, 1972, 47/5875
Int. Cl. H01p 1/10; H01h 47/04, 47/18
U.S. Cl. 333—7 R 7 Claims

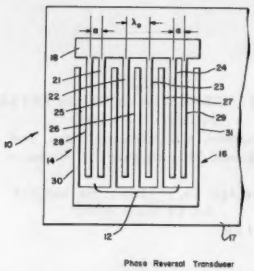


In a switching arrangement of the type having a plurality of coils simultaneously connected to a power source for causing movement of coil-associated switches, the addition of coil response time and release time adjusting means to control selective switching of two input signals to an output without incurring momentary signal interruption at the output. The response and release times are adjusted so that the switches associated with the signal to be connected to the output finish their movement before or at the same time as the start of movement of the switches associated with the signal to be disconnected from the output. The energization response time of each switch controlling relay coil is controlled by a variable resistance in series between the energizing source of power and the relay coil. The de-energization release time of each switch controlling relay coil is controlled by a variable resistance in parallel with said relay coil.

3,792,381
SURFACE-WAVE ELECTRO-ACOUSTIC TRANSDUCER

Thomas W. Bristol, Orange, Calif., assignor to Hughes Aircraft Corporation, Culver City, Calif.

Filed Feb. 20, 1973, Ser. No. 334,180
Int. Cl. H03h 9/04, 9/26, 9/30
U.S. Cl. 333—72 8 Claims



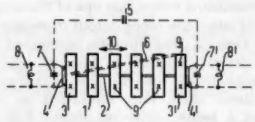
Phase Reversal Transducer

A family of surface-wave electro-acoustic transducers is realized that provide a large class of response functions that combine the smooth spectral characteristics which are unique to periodic transducers, and that possess a minimum of acoustic diffraction effects which are unique to unapodized transducers. In particular, an unapodized central array on a piezoelectric substrate is flanked by an identical pair of similar but smaller unapodized arrays of the same periodicity as that of the central array. The flanking arrays are spaced within one wavelength of, and in a phase reversal relationship with the central array. The configuration of the spectral response function is varied by adjusting the ratio of the number of sources in each of the flanking arrays to the number of sources in the central array. A source is defined as being distributed between a pair of electrodes of opposite polarity.

3,792,382
FILTER FOR ELECTRICAL OSCILLATIONS

Alfhart Guenther, Haar, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 19, 1973, Ser. No. 342,491
Claims priority, application Germany, Mar. 23, 1972, P 22 14 252.5
Int. Cl. H03h 9/26, 13/00
U.S. Cl. 333—72 11 Claims



A filter for electric oscillations comprises n resonators, where $n = 4$, which are coupled by line elements and have line

characteristics. The filter has an input impedance which tends to zero on at least one side of the pass band, and also has a maximum at a given frequency, the echo attenuation in the pass band having more than one maximum. At least two of the echo attenuation poles occur at non-physical frequencies ($p_o = \pm\sigma + j\omega$). The absolute value of the real part (σ) of the poles amounts to at least the n^{th} part of the 3dB bandwidth of the filter.

3,792,383

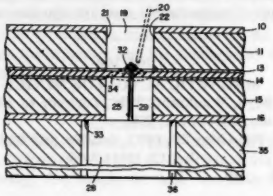
HYBRID STRIP TRANSMISSION LINE CIRCUITRY AND METHOD OF MAKING SAME

Thomas A. Knappenberger, Phoenix, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed June 21, 1971, Ser. No. 154,810

Int. Cl. H01p *3/08, 11/00, 1/30*

U.S. Cl. 333—84 M **8 Claims**



A stripline circuit using discrete and distributed circuit components is disclosed wherein the discrete members are fixed to one ground plane, the leads thereof extend through openings in the ground plane and attached dielectric board through a flexible distributed circuit carrier and are soldered to the strip circuit being carried by the flexible carrier. The covering (second) ground plane and attached dielectric board has an access opening on the opposite side of the circuit from the discrete components for enabling the soldered connection to be made. The access openings in the covering ground plane and attached dielectric member are of sufficient size to permit flexing of the flexible circuit carrier during differential thermal expansion of the leads and the dielectric members. The same is true for the other ground plane and attached dielectric member. Stress-free and crack-free solder connections are thus achieved, and the solder connections can be removed for servicing and the like of the discrete components even though the ground planes, dielectric boards and circuit carrier are bonded together.

3,792,384

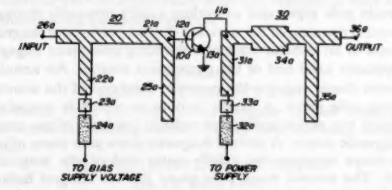
CONTROLLED LOSS CAPACITOR

Richard E. Hunt, Tempe, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Jan. 25, 1972, Ser. No. 220,066

Int. Cl. H01p *3/00, 3/08*

U.S. Cl. 333—84 M **3 Claims**



A variable loss transmission line including conductive strips of polycrystalline silicon deposited on a substrate. The polycrystalline silicon is selectively doped with an impurity to vary the resistance of the strips, thereby varying the loss or attenuation characteristics of the transmission line.

3,792,385

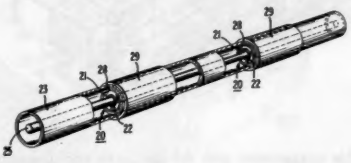
COAXIAL MAGNETIC SLUG TUNER

Louis Sebastian Napoli, Trenton, and John Joseph Hughes, Spotswood, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 6, 1972, Ser. No. 303,798

Int. Cl. H01p *1/00, 5/04*

U.S. Cl. 333—97 R **4 Claims**



A movable magnetic tuning slug capacitively coupled to both the center conductor and outer conductor of an electromagnetic transmission line is used to provide a desired transmission line impedance in response to an applied magnetic field.

3,792,386

RECTANGULAR WAVEGUIDE HAVING SHAPED EXTERNAL CONTOUR PREVENTING INTERNAL DEFORMATION DURING BENDING OR TWISTING

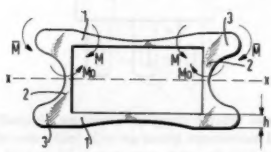
Richard Schuster, and Wolfgang Loew, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Mar. 22, 1973, Ser. No. 343,881

Claims priority, application Germany, Apr. 7, 1972, P 22 16 802.1

Int. Cl. H01p *3/14*

U.S. Cl. 333—95 A **3 Claims**



A rectangular waveguide has a cross section such that twisting or bending does not distort the internal cross section, lips being provided at each corner of the waveguide and the wall sections being shaped such that when viewed from a shorter side each corner has a portion with a substantially T-shaped section, and while viewed from a long side each corner has a pronounced asymmetric T-shaped section.

3,792,387

PUSHBUTTON TUNING SYSTEM

William Lee Arrington, Batavia, and Lee Irving Merz, Williamsville, both of N.Y., assignors to GTE Sylvania Incorporated, Seneca Falls, N.Y.

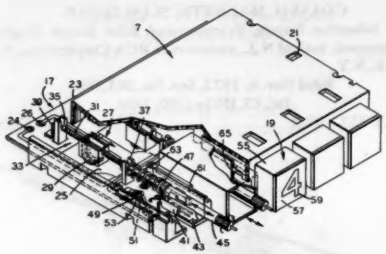
Filed Jan. 26, 1973, Ser. No. 326,759

Int. Cl. H03j *1/00*

U.S. Cl. 334—7 **8 Claims**

A pushbutton tuner module for a signal receiver employing a voltage-dependent type tuner includes an enclosure with

upper and lower portions formed to join one another to provide a plurality of aligned openings, a printed circuit board means disposed within the enclosure and including a pair of switches, a light source, and an adjustable resistance for each one of the aligned openings, and a pushbutton formed for



slidable engagement with the enclosure and disposed within each one of the openings for effecting engagement and disengagement of the switches, energization and de-energization of the light source, and coupling and decoupling of the adjustable resistor to the voltage-dependent tuner.

3,792,388

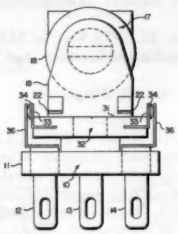
ELECTRICAL RELAY

Ora Ray Fleming, Pico Rivera, Calif., assignor to Teledyne, Inc., Los Angeles, Calif.

Filed Apr. 30, 1973, Ser. No. 355,815

Int. Cl. H01h *50/60*

U.S. Cl. 335—135 **6 Claims**



An electrical relay having an armature pivotally mounted for rotational movement about an axis, and a movable contact assembly carried by the armature. Electrical continuity between the movable contact assembly and selected stationary terminals of a header assembly is achieved through compression loaded contacts at the rotational axis of the armature, thereby avoiding problems experienced with the conventional flexible wire connectors of the prior art.

3,792,389

FLASHLIGHT AND SWITCH ASSEMBLY

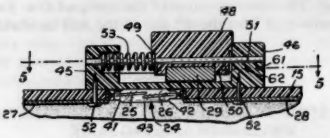
John D. Murphy, 22 E. 22nd St., Bayonne, N.J.

Continuation-in-part of Ser. No. 156,661, May 25, 1971. This application Dec. 22, 1971, Ser. No. 210,791

Int. Cl. H01h *9/00*; **F21i** *7/00*

U.S. Cl. 335—205 **5 Claims**

An improved flashlight construction which substantially reduces the possibility of arcing, having a glass enclosed magnetic reed switch electrically connected to the conductor strips along the wall of the flashlight case and having the magnet required to close the contact arms of the reed switch incorporated into a slidably mounted switch cover, the conductor strips being electrically connected in a fixed position between the conductor rings at the ends of the case. In a modified form of the switch assembly, the magnet is positioned in a preformed case which is mounted on the outside of



the flashlight case so that the movable parts of the switch are completely separated from the internal parts of the flashlight. Other modifications of switch covers having magnets mounted therein which can be locked in either the "On" or "Off" position by means of magnetizable steel are also shown.

3,792,390

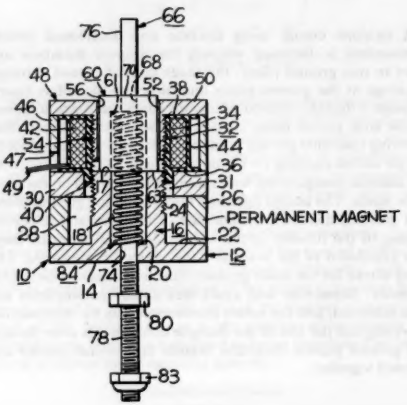
MAGNETIC ACTUATOR DEVICE

Donald R. Boyd, Waukesha, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed May 29, 1973, Ser. No. 365,024

Int. Cl. H01f *7/08*

U.S. Cl. 335—229 **15 Claims**



There is provided in accordance with an embodiment of the invention a magnetic actuator device, such a flux cancelling, transferring or shifting type trip device comprising an annular permanent magnet, and a first main pole piece of magnetic material engaging one axial end of the permanent magnet and a threaded magnetic hollow stud member integral with the first main pole piece and extending axially upwardly through the central opening of the annular-shaped permanent magnet. One end of an annular magnetic shunting pole piece engages the opposite axial end of the permanent magnet. An annular magnetic sleeve engages the opposite axial end of the annular shunting pole piece. A plastic bobbin on which is wound an electrical trip coil is positioned radially inwardly of the annular magnetic sleeve. A second magnetic main pole piece of annular-shape engages the axially outer end of the magnetic sleeve. The second main pole piece has an integral hollow threaded magnetic stud member extending axially inwardly of the assembly. A hollow cylindrical magnetic armature is axially movable against a spring force through the opening of the annular second main pole piece and in the communicating

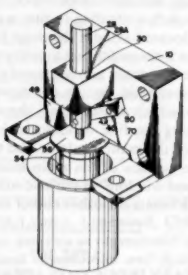
hollow interior of the stud member carried by the second main pole piece. The armature is normally held in magnetically latched position by the magnetic field of the permanent magnet against the spring force and in contact with the axially inner end of the stud member carried by the first main pole piece. When a signal pulse is applied to the coil, a substantial amount of the permanent magnet flux is diverted through the shunting pole piece, permitting the biasing spring force to move the armature to a tripped position. An important feature of the construction is the fact that the plastic bobbin on which the trip coil is wound is threadedly engaged with the threaded studs carried by the oppositely disposed first and second main pole pieces whereby to hold the assembly securely together without the use of bolts or other fastening means. A further feature of the construction is the provision of a "built-in" non-magnetic gap on the movable armature member in the form of a plated coating of a non-magnetic material on the surface of the armature which engages the stud member of the first pole piece in the latched position of the armature. This "built-in" gap, insures that the movable armature and cooperating stationary magnetic structure operate at an optimum point or region on the curve of magnetic force exerted on the armature vs. gap between the armature and the axially inner end of the stud member carried by the first main pole piece.

3,792,391

ELECTRICALLY OPERATED TWO POSITION ELECTROMECHANICAL MECHANISM

Lionel Lee Ewing, 750 Maple St. Apt. No. 21-B, Manfield, Ohio

Filed Dec. 18, 1972, Ser. No. 316,079
Int. Cl. E05b 47/02; H01f 7/16
U.S. Cl. 335—254 **6 Claims**



An electrical type of lock wherein the mechanical movement is actuated in response to a solenoid system triggered by an electrical momentary signal. The locking bolt alternatively changes from a locking to unlocking position or vice versa in a snap action and is retained in its respective position. The bolt is modified by mechanical means in association with the solenoid.

The locking arrangement and its actuation circuitry is particularly adaptable to a system wherein the initiating voltage is transmitted via communication lines i.e., telephone lines from a remotely located control station.

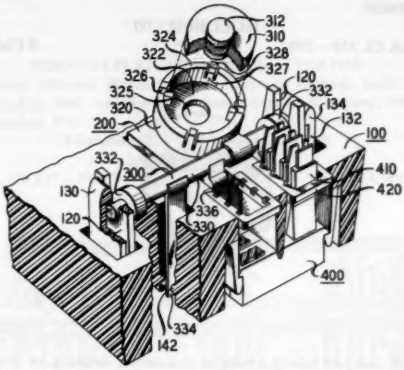
3,792,392

RELAY CONSTRUCTION

Karl-Heinz Pohl, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 18, 1972, Ser. No. 316,415
Int. Cl. H01f 7/08
U.S. Cl. 335—270 **10 Claims**

The relay construction uses molded parts that are assembled without the use of fasteners. The relay comprises an electromagnet consisting of a core that is snap-mounted within a spool, the spool in turn being snap-mounted within an enclosure. An armature support, which includes an integral spring



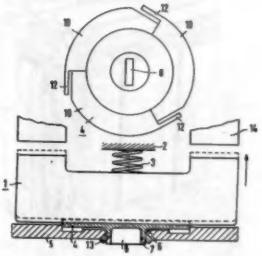
for biasing it to its unoperated position, is pivotally secured by snap-mounting to the enclosure and the armature itself is snap-mounted to the support.

3,792,393

ARRANGEMENT FOR ADJUSTING THE AIR GAP IN AN ELECTROMAGNETIC SWITCHING APPARATUS

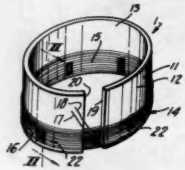
Georg Streich, and Johann Bauer, both of Amberg, Germany, assignors to Siemens Aktiengesellschaft, Munchen, Germany

Filed Dec. 13, 1972, Ser. No. 314,563
Claims priority, application Germany, Dec. 16, 1971, 2162363
Int. Cl. H01f 7/08
U.S. Cl. 335—273 **7 Claims**



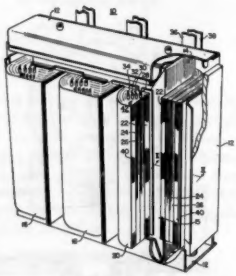
In an electromagnetic switching apparatus where the non-switching magnet part is in a housing and spring loaded in the direction toward the housing, means are provided for adjusting the air gap between the switching and non-switching magnet parts when the magnet is not energized, said means comprising at least one adjusting part having wedge surfaces and adjustable in the housing, being placed between the non-switching magnet part and the housing, such that the non-switching magnetic part can be lifted from the housing by moving the adjusting part.

3,792,394
VOICE COIL
Jose Juan Bertagni, 1027 Hernandarias St., Buenos Aires, Argentina
Filed Nov. 1, 1972, Ser. No. 302,639
Claims priority, application Argentina, Dec. 16, 1971, 239650
Int. Cl. H01f 5/00
U.S. Cl. 335—299 8 Claims



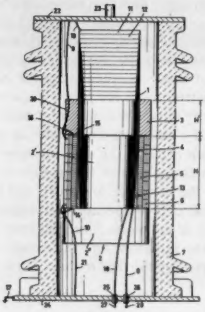
Voice coil having a tubular coil carrier defining an outside face and an inside face, a coil including at least a forward pitch layer of turns on said outside face and a backward pitch layer of turns on said inside face and preferably window openings in said carrier in the zone covered by said layers.

3,792,395
ELECTRICAL INDUCTIVE APPARATUS HAVING SHEET AND STRAP WOUND WINDINGS
George P. Michel, South Boston, Va., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Apr. 3, 1973, Ser. No. 347,509
Int. Cl. H01f 21/12
U.S. Cl. 336—5 4 Claims



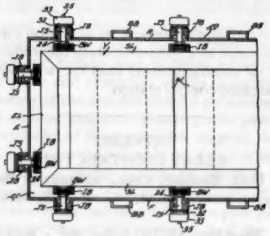
A power distribution transformer having a multiple section high-voltage winding. At least one section is wound from sheet conductor material. Another section is wound from strap conductor material and is disposed concentrically around the sheet wound section. Tap leads are attached to the strap wound section and are connected to tap changing apparatus. The setting of the tap changing apparatus determines the extent to which the strap wound section is connected in series with the sheet wound section, and thus determines the voltage rating of the high-voltage winding.

3,792,396
VOLTAGE TRANSFORMER
Vaino Tuure Kalevi Panu, Vaasa, Finland, assignor to Oy Stromberg AB, Vassa, Finland
Filed Mar. 20, 1973, Ser. No. 343,147
Claims priority, application Finland, Apr. 7, 1972, 975/72
Int. Cl. H01f 15/04, 15/14
U.S. Cl. 336—69 14 Claims



A voltage transformer comprising a hollow support insulator within which is arranged a main insulator and associated with this, a magnetic circuit, at least one primary winding and at least one secondary winding, together with necessary conductors. The main insulator is of tubular form and made up of a number of metal foil tube elements located inside each other in such a manner as to overlap each other partially but not completely, with insulator elements of tubular form arranged between them. A first winding (either a primary or a secondary winding) is located around the main insulator and a second winding (either a secondary or a primary winding) is located inside the main insulator approximately opposite to said first winding. The magnetic circuit comprises two separate core sections, one of which extends from the surface of the main insulator, enclosing the first winding, at least approximately to the other end of the main insulator and the other of which extends from the surface of the main insulator, enclosing from inside the second winding, to the said other end of the main insulator where it meets the other end of the first core section.

3,792,397
STATIONARY INDUCTION APPARATUS HAVING SOUND ATTENUATING CORE CLAMPING MEANS
Arthur P. Reinemann, West Allis, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.
Filed July 2, 1973, Ser. No. 375,736
Int. Cl. H01f 27/26
U.S. Cl. 336—92 15 Claims



A shunt reactor has adjustable, spring-loaded jackscrew core clamping means which attenuate vibratory forces trans-

mitted from the magnetic core to the tank walls and permit adjustment of core clamping pressure from the exterior of the tank.

3,792,398

BOBBIN END PLATE WITH MEANS FOR FASTENING OF SOLDERING TABS

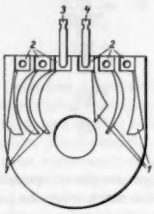
Alf Helge Bernhard Norlin, Katrineholm; Anders Natanael Olsson, Stockholm, and Tore Sven Strid, Katrineholm, all of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed May 17, 1973, Ser. No. 361,198

Claims priority, application Sweden, June 19, 1972, 8070/72

Int. Cl. H01f 15/10

U.S. Cl. 336—192 **2 Claims**



An end plate for a bobbin comprising a L-shaped piece of an insulating material the first branch of which having a through hole for a core and a number of grooves for connecting wires to windings of the bobbin and the second branch of the end plate having notches for placing soldering tabs, each groove in the first branch emerging into a notch in the other branch, the emerging point having the form of a narrow mouth which the connecting wires pass on their way to the soldering tabs and which after the bobbin windings are completed are closed, thus locking connecting wires to the bottom of the notches.

3,792,399

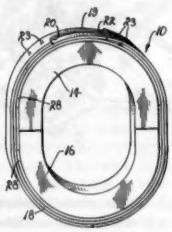
BANDED TRANSFORMER CORES

Colonel William T. McLyman, Lakewood, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 28, 1972, Ser. No. 284,245

Int. Cl. H01f 27/26

U.S. Cl. 336—210 **6 Claims**



A banded transformer core formed by positioning a pair of mated, similar core halves on a supporting pedestal, encircling the core halves with a strap, selectively applying tension thereto, whereby a compressive force is applied about the periphery of the core for reducing the innate air gap between the core halves, and welding the strap at a cruciform joint. A d.c. magnetic field is employed in supporting the core halves during initial phases of the banding operation, while an a.c. magnetic field subsequently is employed for detecting dimension changes occurring in the air gaps as tension is applied to the strap.

3,792,400

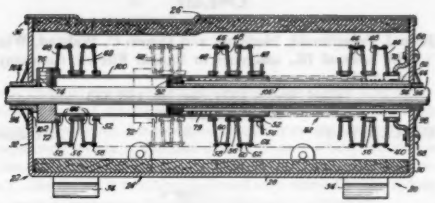
TEMPERATURE RESPONSIVE ACTUATOR

Thomas Edward Hayes, and Jon Harold Bechtel, both of Goshen, Ind., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Jan. 17, 1973, Ser. No. 324,310

Int. Cl. H01h 71/16

U.S. Cl. 337—38 **13 Claims**



A temperature responsive actuator made up of a bellows-like arrangement of bimetal spherical washers which are arranged in pairs with their concave surfaces in opposing relation. One end of the bellows-like arrangement is attached to a frame member and the other end is coupled to a controller rod which extends axially through the center of the bimetal washer arrangement. A heat control means for supplying heat internally of the bimetal washer arrangement is provided which is energized by a control signal from a remotely located temperature sensor element.

3,792,401

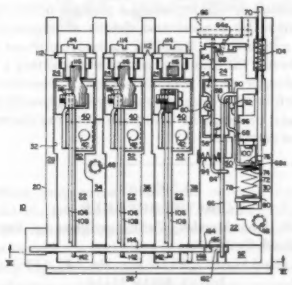
THERMALLY RESPONSIVE ELECTRICAL DEVICE

Paul T. Anderson, Beaver, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 29, 1972, Ser. No. 267,272

Int. Cl. H01h 37/30

U.S. Cl. 337—49 **1 Claim**



An electrical control device or relay characterized by a pair of relatively separable contacts, means for moving the contacts between open and closed positions and comprising a latch member movable between unlatched and latched positions corresponding respectively to the open and closed posi-

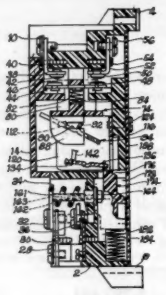
tions of the contacts, three pole units of which each pole unit comprises a bimetal element responsive to current flow to effect heating thereof, a slide assembly associated with the bimetal elements of the pole unit and comprising first and second slides and a lever, the slide assembly being movable as a unit to move the latched member to the unlatched position when all of the bimetal elements are oerated, the lever being pivotally mounted on the second slide and engageable with the latch member, the first slide being movable in response to movement of at least one bimetal element to move the latch member through the lever to the unlatched position, the second slide being limited against movement when at least one of the bimetal elements is unoperable, and the first slide contacting the lever at a location between the location of mounting of the lever on the second slide and of engagement between the lever and the latch member.

3,792,402

ELECTRICAL CIRCUIT CONTROLLER

John J. Peluchiwski, Medinah, and Dennis C. Walstad, Winfield, both of Ill., assignors to Furnas Electric Company, Batavia, Ill.

Filed Nov. 3, 1971, Ser. No. 195,433
Int. Cl. H01h *61/02*
U.S. Cl. 337—59 **23 Claims**



A manually operated switching device which includes a pivotally mounted actuating bracket carrying a cross bar which advances toward and away from a set of fixed contacts as the bracket is rotated. A set of movable contacts on the cross bar make or break the circuit as the bar is moved. A thermal overload device including a plunger normally held in a fixed position by a pawl and detent arrangement but in response to excess heat caused by excessive current in a controlled conductor the detent may rotate permitting a spring to drive the plunger to a position where it operates a reset bracket which in turn operates the actuating bracket opening the circuit and prevents its operation until the thermal overload has been removed.

3,792,403

CIRCUIT BREAKER

John Bullock, Los Angeles, Calif., assignor to Arrow-Hart, Inc., Hartford, Conn.

Filed May 27, 1971, Ser. No. 147,449
Int. Cl. H01h *21/16*
U.S. Cl. 337—66 **38 Claims**

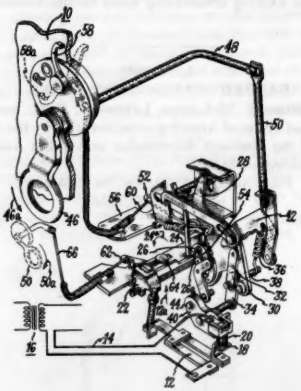
A novel latch and release mechanism for an electrical circuit breaker is disclosed herein wherein the switch assembly is held closed while contact loading pressure by-passes a thermal release mechanism so that this latter mechanism is unloaded. Trip cams are provided which are responsive to movement of the thermal release mechanism for releasing the load on the latch mechanism wherein spring pressure urges the latch open and the contact closures of the switch assembly open. A temperature compensation means is operatively coupled to the trip cams of the release mechanism for pre-setting the precise release point of the contact loading pressure.

3,792,404

CIRCUIT BREAKER HAVING MECHANICAL LOCK TO PREVENT AUTOMATIC OPERATION

Louis F. Ettlinger, Conover, and Donald R. Barger, Newton, both of N.C., assignors to General Electric Company, Pittsfield, Mass.

Filed Aug. 30, 1972, Ser. No. 285,046
Int. Cl. H01h *71/16, 71/52*
U.S. Cl. 337—72 **4 Claims**



A mechanical lock for a circuit breaker. The locking mechanism includes a pivoted lever mounted on a fixed portion of the circuit breaker. The pivoted lever includes a hooked portion which may be pivoted into or out of engagement with the latch member of the circuit breaker. When engaging the latch member, the pivoted lever prevents automatic operation of the circuit breaker, while still allowing manual operation thereof. The pivoted lever has an operating member which is operable from the exterior of the tank enclosing the circuit breaker.

3,792,405

WIPER INTERMITTENTLY OPERATING DEVICE

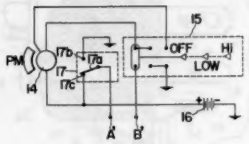
Akitomi Hatsugai, and Kazuyuki Ishida, both of Kiryu, Japan, assignors to Mitsubadenkiseisakusho Co., Ltd., Gunma-Prefecture, Japan

Filed Oct. 18, 1971, Ser. No. 189,938

Claims priority, application Japan, Dec. 18, 1970, 45/126473

Int. Cl. H01h *61/06*

U.S. Cl. 337—140 6 Claims



An intermittently operating wiper device wherein periodically and intermittently wiping operation is produced by adding a circuit containing: a) a lagging relay which is provided in a wiping mechanism intermittently activated by being heated and cooled by the intermission of an adjustable heating current, and b) an intermittently wiping switch having ON, OFF contacts or ON contact, to a circuit having a wiper motor connected to the well-known wiper switch, and an auto-stop relay controlled by said wiper motor. The invention also includes improvements in the lagging relay used in said intermittently operating device.

3,792,406

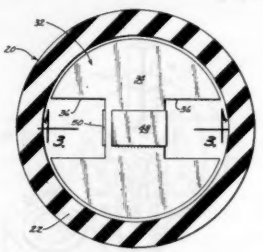
FUSE RESISTOR AND THE METHOD FOR MAKING SAME

Clifford A. Kreifels, Columbus, Nebr., assignor to Dale Electronics, Inc., Columbus, Nebr.

Filed Nov. 26, 1971, Ser. No. 202,307

Int. Cl. H01h *85/14*

U.S. Cl. 337—163 9 Claims



A fuse resistor is comprised of a wire resistor adapted to fuse and break in response to a predetermined magnitude of current passing therethrough. A silicone rubber casting surrounds the wire resistor. The wire resistor and the silicone rubber coating are embedded within a dielectric body member, and electrical contact means are connected to the resistor and extend outside the body member. The body member can be a disc which is adapted to be inserted within a light bulb socket between the light bulb and the terminals of the socket. The method of the present invention comprises coating a wirewound resistor with a silicone rubber, and molding the wire-wound resistor within an electrically insulative material so that the resistor is embedded within the insulative material with only its terminals protruding outwardly therefrom.

3,792,407

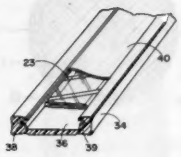
CHANNEL MOUNTED LEVEL SENSOR

Albert D. Ehrenfried; Norton T. Pierce, both of Concord, Mass., and Mason G. Ide, Nashua, N.H., assignors to Metritape, Inc., West Concord, Mass.

Filed Sept. 15, 1971, Ser. No. 180,608

Int. Cl. G01f *23/00*

U.S. Cl. 338—13 8 Claims



A channel mount for an elongated level sensor which provides a rugged mechanical housing while not detracting from sensor sensitivity. An elongated spatially continuous sensor is supported within a channel-shaped mount which includes a planar facing closely adjacent the sensitive surface of the sensor. The facing is movably disposed with respect to the mount to permit transverse deformation for sensor actuation.

3,792,408

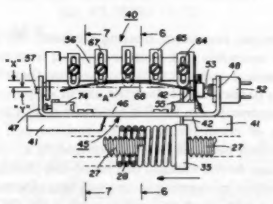
MOTION RESPONSIVE ELECTRICAL CONTROL APPARATUS

Joseph E. Gorgens, 116 Old Dyke Rd., Trumbull, Conn., and William A. Heske, 2101 Burr St., Fairfield, Conn.

Division of Ser. No. 113,419, Feb. 8, 1971, which is a continuation-in-part of Ser. No. 859,246, Sept. 17, 1969, abandoned, which is a continuation of Ser. No. 732,472, April 12, 1968, abandoned, which is a continuation-in-part of Ser. No. 565,857, July 18, 1966, abandoned. This application Jan. 8, 1973, Ser. No. 322,039

Int. Cl. H01c *5/00*

U.S. Cl. 338—91 7 Claims

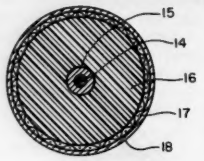


A motion responsive electrical control apparatus for emitting an electrical control signal incrementally variable in desired correlation to a path of given mechanical motion. The apparatus includes a rotatably regulated electrical controller for emitting signals correlated to the angular position setting of the controller regulator. A cam member pivotally mounted onto the regulator of the controller is arcuately biased into overlying engagement with a movable follower defining a motion path to which the apparatus is to respond. Presettably adjustable pitch members incrementally spaced along the path of follower motion effect desired incremental changes in cam pitch thereat affording corresponding change to the controller position setting.

3,792,409
ELECTROSTATIC HAND GUN CABLE

William L. Smart, and Paul S. Gregg, both of Indianapolis, Ind., assignors to Ransburg Corporation, Indianapolis, Ind.

Filed Apr. 2, 1973, Ser. No. 347,240
Int. Cl. H01c 13/00; H01b 1/06, 9/02
U.S. Cl. 338—214 1 Claim

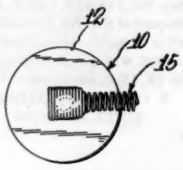


An improved high voltage cable for usein electrostatic hand guns and includes a semiconductive stranded fiber glass core within a semiconductive shield surrounded by body of insulative material, a flexible conductive sheath in an outer protective covering; the semiconductive core and semiconductive shield provide resistance of not less than 20,000 and not more than 300,000 ohms per foot of cable length.

3,792,410
ELECTRICAL CONNECTIONS

Leo J. Klein, Clairton, Pa., assignor to Emerson Electric Co., St. Louis, Mo.

Division of Ser. No. 150,010, June 4, 1971, Pat. No. 3,702,387.
This application Aug. 30, 1972, Ser. No. 285,070
Int. Cl. H01c 1/14
U.S. Cl. 338—296 3 Claims



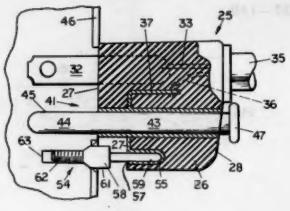
In an electric resistance heating element, the invention relates to the assembly of a resistor coil to a terminal pin to provide mechanical and electrical connection therebetween. The assembly is particularly suited for use in strip heaters wherein the coil is connected to the flat head of a terminal bolt.

A group of convolutions of the resistor coil are flattened against the bolt head and welded thereto by a resistance welding operation. In the method disclosed, the shank of the bolt is disposed within an opening in one welding electrode of a welding machine with the bolt head overlying the tip of such electrode, and the group of convolutions of the coil are placed against the flat surface of the bolt head. The other welding electrode has a rounded tip and as this electrode is moved toward said one electrode, its rounded tip flattens the group of convolutions in overlapping relation on the flat surface of the bolt head. With the flattened convolutions and the bolt head firmly gripped between the welding electrodes, welding current is caused to flow between the electrodes to weld the flattened convolutions to the flat surface of the bolt head. Those flattened convolutions at the center of the rounded tip of said other electrode are fully fused to the flat surface of the bolt head, whereas the convolutions off the center of such rounded tip have a stick weld to the flat surface. Thus, not only is a low resistance electrical connection made by the fully fused convolutions, but a good mechanical connection is made by the stick-welded convolutions.

3,792,411
ELECTRIC PLUG WITH BOTH REMOVABLE AND PIVOTABLE GROUND PINS

Robert L. Jenkins, P.O. Box 115, North Salem, N.H.

Filed Jan. 3, 1972, Ser. No. 214,566
Int. Cl. H01r 3/06
U.S. Cl. 339—14 P 9 Claims

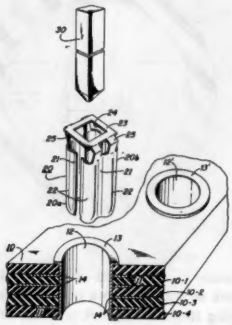


A male electric plug is of the type having a first grounding means and also a second grounding means. The first grounding means is an elongated ground pin member movable in a grounded socket member and the second grounding means is an inflexible element mounted on, integral with and grounded with one of the members for connection to an outlet plate. In one form both grounding means are pins freely slidable in grounded sockets. In another form the first grounding means is a pin pivotable in a socket and an integral tail on the pin is the second grounding means.

3,792,412
PRINTED WIRING BOARD TERMINAL ASSEMBLY

James Joseph Madden, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 17, 1972, Ser. No. 272,317
Int. Cl. H05k 1/02
U.S. Cl. 339—17 C 5 Claims



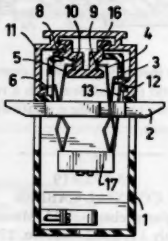
A printed wiring board terminal assembly in which an adapter sleeve is inserted between the plated surface of a terminal hole and a terminal pin. The adapter sleeve is fashioned to present a plurality of longitudinal contacting nodes which expand radially to make electrical contact with the plating as the pin is inserted. The normal potentially damaging longitudinal stresses induced during pin insertion are thus converted to radial forces to preclude strain at the plating-wiring interfaces.

3,792,413

CONNECTING PLUG FOR AN ELECTRIC CURRENT SUPPLY RAIL

Mikko Aukusti Hyrlainen, Helsinki, Finland, assignor to Oy Nokia Ab, Helsinki, Finland

Filed Sept. 1, 1972, Ser. No. 285,853
Claims priority, application Finland, Sept. 6, 1971, 2490/71
Int. Cl. H01r 9/00
U.S. Cl. 339—21 R 3 Claims



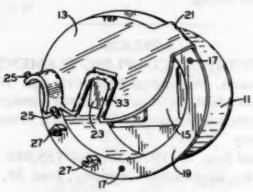
A connecting plug for an electric current supply rail, comprising a casing and contact fingers flexibly fastened in said casing. An operating device preferably in the shape of a plate is arranged in the casing and is slidingly displaceable along said contact fingers between an inoperative position where the contact fingers are withdrawn into the casing and an operative position where the contact fingers are pushed out to protrude from said casing.

3,792,414

POWER CORD HATCH

Gregory A. Smith, North Webster, Ind., assignor to Lyall Electric, Inc., Albion, Ind.

Filed Mar. 15, 1972, Ser. No. 234,848
Int. Cl. H01r 13/62
U.S. Cl. 339—36 8 Claims



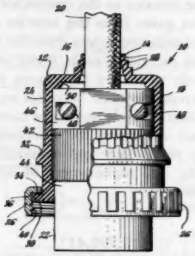
An improved hatch for a power supply cord to be used on travel trailers and similar structures wherein it is desired to store within the structure a power supply cord and within the hatch the power supply cord plug and, from time to time, extract that cord and connect it to a source of electrical current is disclosed. The hatch may be fabricated as one piece from polypropylene or other resilient material, there being an integral hinge which pliably couples the hatch housing and cover, and there may be a second integral hinge which pliably couples a flap to the cover or to the hatch housing to selectively open and close a notch in the cover through which the power cord may pass. Means for allowing one way passage of the plug through the back of the hatch during assembly and subsequently preventing its removal during use is also disclosed.

3,792,415

WEATHERPROOF COVER FOR ELECTRICAL CABLE CONNECTOR

Alvin W. Fuller, Shelton, Conn., assignor to Harvey Hubbell, Incorporated, Bridgeport, Conn.

Filed Mar. 13, 1972, Ser. No. 234,261
Int. Cl. H01r 13/52
U.S. Cl. 339—60 R 6 Claims



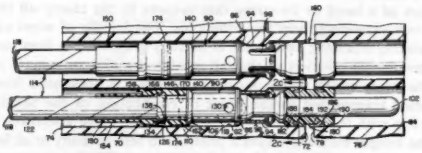
Apparatus for weatherproofing an electrical cable connecting device, particularly where both an improved cable seal and greater cable flexibility are attained. A cable sealing gland is disposed on a flexible diaphragm to relieve the strain developed in the gland when the cable flexes. Gland resistance to cable flexure is overcome by relieving axial strain through distortion of the diaphragm about an axis perpendicular to the axis of the cable. Separation of the gland from the cable is overcome by relieving lateral strain through distortion of the diaphragm to reorient the axis of the gland in the direction of cable flexure. The diaphragm is disposed on a spacing ring as the end wall of a sealing boot which is otherwise configured to fit conventionally over the cable connecting device.

3,792,416

SYSTEM, METHOD AND SEAL FOR PRESSURE-SENSITIVE WIRE AND INTERFACE SEALING OF ELECTRICAL CONNECTOR ASSEMBLIES AND ASSOCIATED CONTACTS

Norbert L. Moulin, Placentia, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 3, 1972, Ser. No. 240,501
Int. Cl. H01r 13/52
U.S. Cl. 339—94 R 54 Claims



Electrical pin and socket contacts, contained within connectors and interconnectable with one another by mating connection of the connectors, are sealed from the environment external to the interior of the connectors and the connection therebetween regardless of changing pressure conditions. Individual pressure-sensitive wire seals are utilized for each contact at the rear of the connectors and a two sided pressure-sensitive interface seal is utilized for sealing between two mating connectors. The pressure-sensitive wire seal at the rear of each connector includes a tubular portion jacketed in sealing contact on the conductor insulation, a cup-shaped flange opening toward the rear of the connector, a wiper land inwardly disposed of the cup-shaped land, and an interlocking

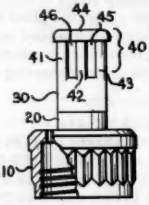
engagement between the seal and the wire-receiving end of the contact. The pressure-sensitive interface seal sealingly engages each pin end of the pin contact and has a pair of cup-shaped seals facing each other and facing the front faces of the two connectors when each pin contact in one connector engages the socket contact of the other connector. The cup-shaped seals, in particular, not only afford the usual pressure sealing capability but also increase their sealing capability when pressure external to the interior of the connector exceeds the pressure interior to the connector while permitting escape of fluids or gases from the interior of the connector when the external pressure is less than the interior pressure. Since the seals are individual seals, if one seal is found to be defective, it is only necessary to remove only that seal for replacement or repair purposes. No other seal or contact need be disturbed. Further, a single one-piece connector is required and no additional extensions or attachments thereto are required, thereby simplifying and economizing the costs of material, assembly, and replacement of defective parts and improving reliability.

3,792,417

STRAIN RELIEF CLAMP FOR AN ELECTRICAL CONNECTOR

Stephen Punako, Bainbridge, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Aug. 23, 1972, Ser. No. 283,028
Int. Cl. H01r *13/58*
U.S. Cl. 339—103 M **8 Claims**



The strain relief clamp designed for use on general purpose multi-pin electrical connector assemblies to the plug or receptacle of the assembly and extending therefrom to terminate in a keeper element which includes apertures to facilitate retention of a band or tie string that secures to the clamp all the wires extending from the connector. The bundle of wires extending from the connector is thereby gripped in a firm and immovable position so that all axial and radial movement of the wires which might occur in operation is prevented from being transmitted to the point of connection of the several wires with the connector contacts. One or more apertures in the keeper element makes it possible to secure many or as few as one wire extending from the connector in the aforementioned manner to prevent breaking the connection point of a wire to a contact.

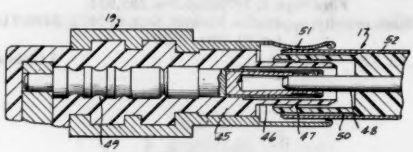
3,792,418

ELECTRICAL CONNECTOR

William A. Kailus, North Riverside, Ill., assignor to Bunker-Ramo Corporation, Oak Brook, Ill.

Filed Sept. 3, 1971, Ser. No. 177,730
Int. Cl. H01r *17/06*
U.S. Cl. 339—177 R **6 Claims**

A high-temperature electrical connector including interengageable mating sections each having a central and an outer-tubular metallic contact and an insulating sleeve disposed therebetween with the insulating sleeve of the one section having self-lubricating surfaces of a fluorocarbon engaging the sleeve or its associated outer-tubular metallic contact of the other section, the fluorocarbon having a relatively low heat deflection temperature so as to deform at high temperatures. The other insulating sleeve is composed of a material such as an aromatic polysulfone with a relatively high heat deflection temperature to provide a relatively rigid support for the fluorocarbon sleeve.

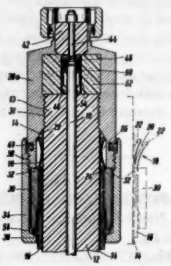


3,792,419

COAXIAL CABLES

Georg Spinner, Erzgiessereistrasse 33, Munich, Germany

Filed July 11, 1972, Ser. No. 270,666
Int. Cl. H01r *17/06*
U.S. Cl. 339—177 R **8 Claims**



A plug connector fitting for coaxial cable comprises contact lugs arranged to contact the bared outer sleeve conductor of the cable. The lugs are pressed radially inwards by cam faces on a sleeve of the fitting.

3,792,420

ELECTRICAL COUPLING ELEMENT

Alfred Konnemann, Wuppertal-Ronsdorf, and Wulf Muller, Wuppertal-Elberfeld, both of Germany, assignors to Fa. Grote & Hartmann Wuppertal-Ronscdorf, Wuppertal-Ronsdorf, Germany

Filed June 23, 1971, Ser. No. 155,966
Claims priority, application Germany, June 30, 1970, P 20 32 194.2
Int. Cl. H01r *13/12*
U.S. Cl. 339—258 R **1 Claim**

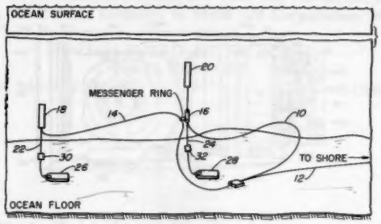
An electrical coupling element having a base portion for connecting the coupling element to a wire conductor, a pair of

spring arms for receiving a flat plug contact therebetween, and a stop spring member disposed between the spring arms for securing the coupling element in a multiple purpose plug housing.

3,792,421
UNDERWATER DATA TRANSMISSION SYSTEM

Larry Vane W. Frazier, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 12, 1972, Ser. No. 270,878
Int. Cl. B63b *21/00*
U.S. Cl. 340—4 R **1 Claim**

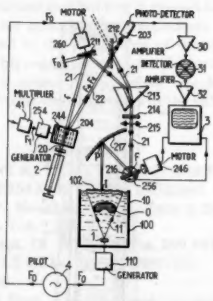


The present invention is a method for raising and lowering an umblical cable into which other cables could be plugged, the cable being retrieved by releasing a connector through a signal sent on the cable. This allows the messenger cable to float to the surface, and after servicing the cable is equipped again with a releasable weight and allowed to fall to the ocean floor.

3,792,422
CAMERAS FOR ACOUSTIC HOLOGRAPHY

Joel Ernvein-Pecquenard, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 2, 1973, Ser. No. 320,192
Claims priority, application France, Jan. 7, 1972, 7200495
Int. Cl. H04n *3/02*; G01n *29/04*
U.S. Cl. 340—5 H **9 Claims**

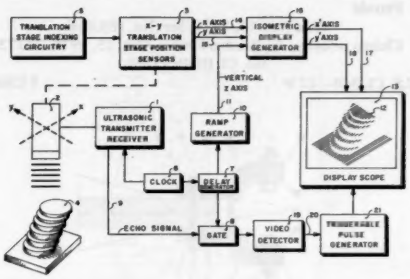


The present invention relates to improvements in laser-scan ultrasonic cameras. In order to substitute an acoustic hologram for the acoustic image presented upon the screen of the cathode ray tube, an optical phase reference and a square-law detection of the photo-signal are added to the usual devices.

3,792,423
ISOMETRIC IMAGING SYSTEM

Frederick L. Becker, and Richard L. Trantow, both of Richland, Wash., assignors to The United States of America as represented by the U.S. Atomic Energy Commission, Washington, D.C.

Filed May 24, 1972, Ser. No. 256,300
Int. Cl. G01s *9/66*
U.S. Cl. 340—5 MP **3 Claims**

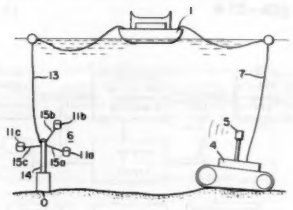


An isometric imaging system for effecting the projection of a three-dimensional coordinate system onto the horizontal and vertical plane of a conventional display scope is provided. The system provides for displaying both spatial and depth information by the novel transformation of the time coordinates of the scanned field, which contains the object, to the horizontal and vertical coordinates of the display scope. In one embodiment a novel sample and hold circuit is provided for processing data on tapes at playback factors greater than 10.

3,792,424
APPARATUS FOR DETECTING THE POSITION OF A MOVABLE ARTICLE UNDER WATER

Shinichi Nakatsuji, Chigasaki-shi, and Keisuke Suzuki, Hiratsuka-shi, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 13, 1971, Ser. No. 188,859
Claims priority, application Japan, Oct. 13, 1970, 45-89291
Int. Cl. G01s *5/18*
U.S. Cl. 340—6 R **4 Claims**



An apparatus for detecting the position of a movable article under water which has at least three ultrasonic receivers equidistantly spaced around a standard point provided on the bottom of the body of water, an ultrasonic transmitter mounted onto the movable article for transmitting pulse ultrasonic waves, means for measuring the difference in the time when the receiver initially receives the ultrasonic wave and the time when the respective receivers receive the ultrasonic wave, and means for calculating the position of the movable article from the receiver initially receiving the ultrasonic wave and the standard point as a standard from the measured result

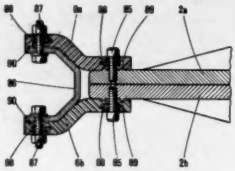
of the measuring means. Thus, the apparatus of this invention may measure the position of the movable article under water regardless of the affect of the reflection of the ultrasonic wave from the rock, etc. on the bottom of the sea.

3,792,425

DEVICES FOR GENERATING ACOUSTIC WAVES IN A LIQUID MEDIUM

Pierre Magneville, Vernouillet, and Claude Duconge, Le Vesinet, both of France, assignors to Institut Francais Du Petrole

Filed Oct. 13, 1971, Ser. No. 188,816
Claims priority, application France, Oct. 15, 1970, 7037350
Int. Cl. H04b *13/00*
U.S. Cl. 340—12 R **9 Claims**



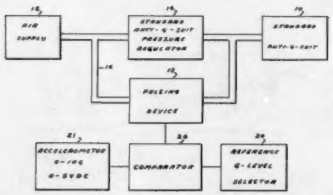
Device for generating acoustic waves in a liquid medium by implosion having two movable rigid members interconnected by a deformable membrane the membrane is formed of two annular strips each perpendicularly secured to the external edge of a movable member and to an annular flange external to the moveable members respectively to form a tight enclosure between the moveable member. At least one annular boss is provided on the external edges of the rigid members and on the annular flange to achieve a proper sealing between the external liquid medium and the enclosure.

3,792,426

TACTILE WARNING DEVICE FOR G-LOADING ANGLE OF ATTACK

Richard L. Ravenelle, Woonsocket, R.I.; Michael J. Moran, New Bern, N.C., and David E. Thorburn, Reno, Nev., assignors to the United States of America as represented by the Secretary of the Air Force

Filed Apr. 6, 1972, Ser. No. 241,568
Int. Cl. G08g *5/00*
U.S. Cl. 340—27 R **6 Claims**



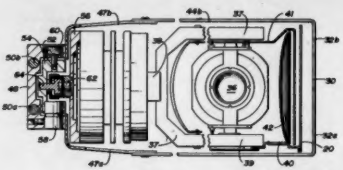
A G-loading or angle of attack tactile warning apparatus having a by-pass air flow path around the standard anti-G-suit pressure regulator with apparatus in the by-pass path to provide a pulse signal to the anti-G-suit when certain limits such as angle of attack or G-load have been exceeded. A signal from an accelerometer or angle of attack sensor is compared with a reference signal from a reference selector. The output of a comparator is used to permit a solenoid to be energized in response to the output of a square wave generator so supply a low frequency pulse to the anti-G-suit. In another embodiment, a comparator output operates a switch in the by-pass line to cause a fluidic oscillator to supply a pulse signal to the anti-G-suit.

3,792,427

AIRCRAFT HORIZON DISPLAY AND STEERING INDICATOR

James R. Younkin, Mineral Wells, Tex., assignor to Mitchell Industries, Inc., Mineral Wells, Tex.

Continuation of Ser. No. 855,984, Sept. 8, 1969, abandoned.
This application Sept. 3, 1971, Ser. No. 177,805
Int. Cl. G01c *19/34*
U.S. Cl. 340—27 NA **8 Claims**



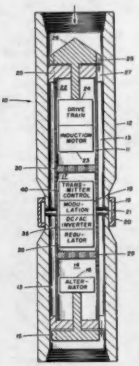
A gyro is gimbaled within a frame which is fixed within an aircraft. Roll indicia is responsive to the gyro for rotation within a display window on the frame about an axis parallel to the roll axis of the aircraft. A horizon indicating member is also responsive to the gyro for movement within the display window to remain parallel to the actual horizon during flight of the aircraft. A steering bar is movable within the display window relative to the roll indicia and the horizon indicating member in dependence upon selected flight guidance commands.

3,792,428

METHOD AND APPARATUS FOR CONTROLLING THE DOWNHOLE ACOUSTIC TRANSMITTER OF A LOGGING-WHILE-DRILLING SYSTEM

John W. Harrell, and James H. Sexton, both of Duncanville, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed July 18, 1972, Ser. No. 272,819
Int. Cl. G01v *1/40*
U.S. Cl. 340—18 NCS **4 Claims**



A logging-while-drilling system utilizes the flow of drilling fluid within a borehole as the transmission medium for teleme-

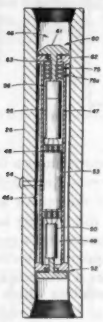
tering downhole logging measurements to the earth's surface. The hydraulic power within the drilling fluid is converted to suitable power for driving a downhole acoustic transmitter which produces an acoustic wave within the drilling fluid which is modulated with the information describing the downhole logging conditions. The power available for driving the transmitter is applied to the transmitter when it exceeds the minimum starting power requirement of the transmitter and is continuously applied to the transmitter so long as it does not, after starting the transmitter, drop below the minimum operating power requirement of the transmitter.

3,792,429

LOGGING-WHILE-DRILLING TOOL

Bobbie Joe Patton; Maurice Jack Prior, both of Dallas; James Howard Sexton, Duncanville, and Vasel Roy Slover, Jr., Irving, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed June 30, 1972, Ser. No. 267,851
Int. Cl. G01v *1/40*
U.S. Cl. 340—18 NC **8 Claims**



A logging-while-drilling tool which is adapted to be positioned within the drill string of a well drilling apparatus. The tool has a turbinelike, signal-generating valve which opens and closes at a rate to generate a pressure wave signal in the drilling fluid which is representative of a measured downhole condition. The tool includes a means for both biasing the valve toward an open position and holding it there when the tool is not operating and for canceling or substantially reducing the torque loads applied to the drive train of the tool when the tool is operating. This means comprises a magnetic unit which develops a magnetic torque characteristic which opposes the normal hydraulic torque characteristics of the valve.

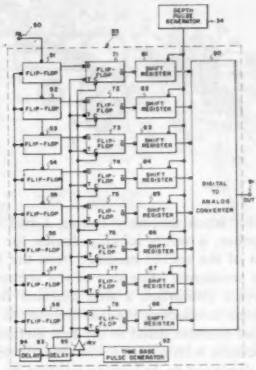
3,792,430

DIGITAL COUNT RATE METER AND DEPTH DELAY SYSTEM FOR WELL LOGGING

Francis J. Niven, Jr., Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sept. 18, 1972, Ser. No. 289,902
Int. Cl. G01v *1/40*; H03k *21/00*
U.S. Cl. 340—18 DC **6 Claims**

Electrical signals from a well logging instrument are coupled to the earth's surface where circuitry is provided for a series of common depth point correlations. In one embodiment, the digitized signals drive an eight-bit counter which is gated through eight respective buffer circuits to eight serial shift registers. The signals in the eight-bit counter section are clocked out to the buffer section once each second regardless of movement of the well logging instrument in the borehole. The signals are shifted from the shift register at the rate of four bits per foot of well logged into a digital-to-analog converter. The amount of delay within the circuit is a function of the number of bits in the shift register divided by the number of depth pulses per foot of well logged. In an alternative embodiment, the analog signal to be delayed is converted to a parallel ten-bit digital signal which is then converted to a series signal which is coupled into a serial shift register. The conversion process is a function of depth pulses relating to the number of feet logged in the well. The output of the serial shift register is connected



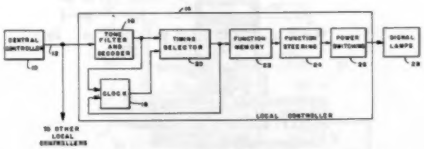
to a series-to-parallel register which is coupled into a digital-to-analog converter. In still another embodiment, the serial shift register is used with means for selecting the length of the register to vary the amount of delay. In yet another embodiment, a plurality of signal channels is coupled through a multiplexer and an analog-to-digital converter to the shift register. As with the other embodiments, a depth pulse generator clocks the pulses through the system and a demultiplexer provides a plurality of analog channels at the output of the system.

3,792,431

TRAFFIC CONTROL SYSTEM

John J. Matysek, Rt. No. 2, Box 151, Crozet, Va.

Continuation-in-part of Ser. No. 863,309, Oct. 2, 1969, Pat. No. 3,605,084, which is a continuation-in-part of Ser. No. 826,212, May 20, 1969, Pat. No. 3,644,884. This application July 27, 1971, Ser. No. 166,404
U.S. Cl. 340—41 **32 Claims**

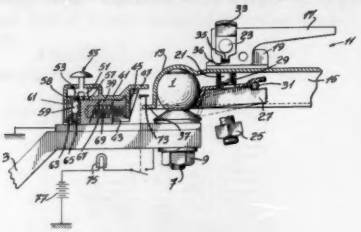


A traffic control system in which a plurality of local controllers are connected to a central controller by means of a single communication channel. Each local controller can include a non-volatile memory which stores the desired cycle for that local controller. When it is desired to alter the cycle of a particular local controller, the central controller applies to the communication channel a code signal uniquely associated with that local controller. This enables the selected local controller to respond to subsequent coded signals altering the cycle, while the remaining local controllers do not respond to such commands. By way of illustration, the coded signals may be coded pulses of unique tones.

3,792,432
SAFETY TRAILER COUPLING

Robert Ellis, R.R. No. 5, South-Durham, and Clarence Ellis, 7e Rang, Wickham, both of Drummondville, Quebec, Canada

Filed Mar. 27, 1972, Ser. No. 238,104
Int. Cl. B60d 1/12; B60g 1/00
U.S. Cl. 340—52 R 6 Claims

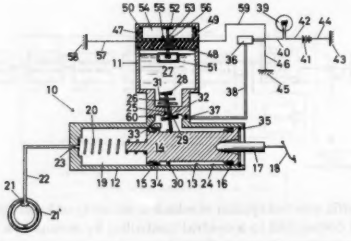


In a trailer hitch assembly having a ball member and a socket member, a safety locking device for preventing the coming out of the socket member from the ball member in case of the accidental loosening of the socket member. The locking device comprises a first element fixed to the attachment plate connecting the ball member to towing vehicle, and a second element fitted to the first element and horizontally displaceable with regard to the first element. The second element is displaced to its locking position by resilient means and retracted to its unlocking position by manual means. Stud means are provided for firmly maintaining, the second element in its displaced positions without the necessity of using a hand. Electrical switch means are removably connected to the second element and are displaceable therewith. They provide the warning of the conductor of the towing vehicle of any defect happening to the hitch assembly.

3,792,433
MASTER CYLINDER FOR HYDRAULIC BRAKING SYSTEM

Takeshi Wada, Toyota City, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 17, 1972, Ser. No. 244,653
Claims priority, application Japan, May 1, 1971, 46/29010; May 15, 1971, 46/32661; May 19, 1971, 46/33776
Int. Cl. B60q 1/44; B60t 11/22
U.S. Cl. 340—52 C 7 Claims

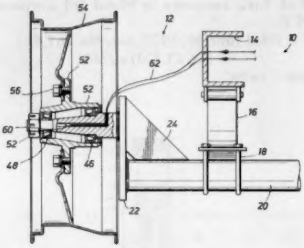


This invention relates to a master cylinder for hydraulic braking system including a cylinder body, a bore formed in the body, a fluid displacing piston slidably mounted within the bore and having primary and secondary cups, a poppet valve interposed between a reservoir and a chamber formed in the bore for closing communication between the reservoir and the chamber against the fluid pressure in the chamber and for opening the communication therebetween against the fluid pressure in the reservoir, the poppet valve and the secondary cup act with the primary cup to form an airtight chamber filled with oil, a first warning of device for warning the failure of the primary cup, a second warning device for warning that the level of the brake fluid in the reservoir is low, and a third warning device for warning when the pressure the brake fluid in the reservoir is below a certain pressure.

3,792,434
BEARING TEMPERATURE SENSING APPARATUS FOR USE ON A TRAILER

James G. Williams, 305 Chelsea Ln., Friendswood, Tex.

Filed July 14, 1972, Ser. No. 271,919
Int. Cl. B60q 1/00
U.S. Cl. 340—57 10 Claims

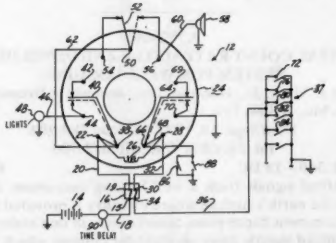


An apparatus which incorporates a thermistor mounted in a stub axle being specially modified by the presence of an axial bore therein wherein the thermistor is positioned within the axle at a point between the bearing surfaces on the exterior thereof and further incorporating a conductor line which extends to an indicating apparatus located elsewhere. The indicating apparatus utilizes a DC power supply which is connected through a relay winding which reverses the operative status of relay contacts to form a visible indication of overheating of the bearings supported on the axle. Current flows from the source through the relay winding and thermistor to ground.

3,792,435
AUTOMOBILE THEFT PREVENTION ALARM SYSTEM

Casper Pace, 141 Rodney Ave., Buffalo, N.Y., and Thomas D. Pace, 1721 N. Cliff St., Alexandria, Va.

Filed May 30, 1972, Ser. No. 257,688
Int. Cl. B60r 25/10
U.S. Cl. 340—63 7 Claims



An automobile theft prevention alarm system having an externally mounted control switch operated by the automobile operator to activate the alarm system. The alarm system com-

prises a central relay connected in series to the automobile battery by the control switch and is adapted to be activated by any of a plurality of sensing switches strategically located throughout the automobile. The relay is, in turn, connected to one or more warning devices, such as the automobile lights and horn, and when activated by one of the sensing switches, such as by the unauthorized opening of a car door or hood, the resulting electrical connection through the relay activates the warning devices. Once the relay has been energized, the subsequent closing of a sensing switch will not deactivate the warning system. In one embodiment of the invention a time delay mechanism is employed to terminate the alarm system after a predetermined period of operation provided the sensing switches are open, that is provided the associated portion of the automobile is returned to a normal authorized position.

3,792,436

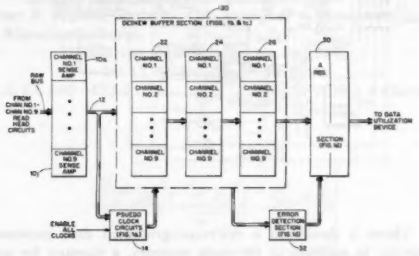
DESKEWING BUFFER ARRANGEMENT WHICH INCLUDES MEANS FOR DETECTING AND CORRECTING CHANNEL ERRORS

David D. De Voy, Dedham; George J. Barlow, Tewksbury, and John A. Klashka, North Andover, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jan. 4, 1973, Ser. No. 321,094

Int. Cl. G06k *5/04;* **G11b** *27/36;* **H03k** *5/18*

U.S. Cl. 340—146.1 F **22 Claims**



A deskewing buffer system includes a plurality of storage registers each of which include a plurality of storage devices. Pairs of the storage devices provide storage for a single information channel. The devices of each channel further includes circuits for detecting when no information has been stored by an input pair of storage devices of a channel within a bit interval which signals a dropped bit within the channel. The detection circuits are then operative to switch both input storage devices of the channel to the same predetermined state. Thereafter, checking circuits coupled to a last register of the buffer system are operative to check the deskewed contents of the register and generate a signal indicating whether the channel dropped a binary ONE or binary ZERO bit. The signal is then used to transfer selectively the state of one of the pairs of storage devices of the channel to an output register.

3,792,437

INSTORE INFORMATION DISPENSING SYSTEM

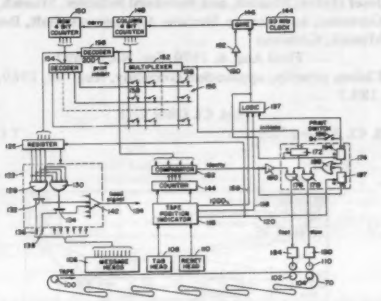
Stanley P. Blumenthal, Canton; Solomon Krasnick, Acton, and Gerald W. Gillespie, Brocton, all of Mass., assignors to Tel-A-Dex Corporation, Dedham, Mass.

Filed Dec. 20, 1971, Ser. No. 210,027

Int. Cl. H04q *5/00*

U.S. Cl. 340—152 R **21 Claims**

A couponning system for instore dispensing of directory and discount information. The couponning system is preprogrammed with an exchangeable record medium having audio directory information and information on items being discounted. The record medium also contains data for printing coupons with discount information to be presented with the purchase of special items. Actuation of a keyboard addresses a particular point on the record medium which is rapidly accessed to provide the information, and if called for by further keyboard actuation, the printing of a discount coupon. An automated production system provides for the rapid production of recording mediums for periodic replacement in the coupon dispensing system distributed throughout a plurality of user stores.



3,792,438

PERIPHERAL ACCESS CONTROL

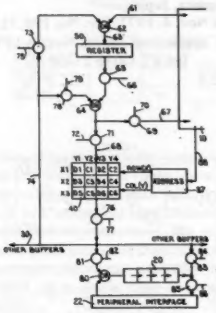
Derek Hurst, Hitchin, England, assignor to International Computers Limited, London, England

Filed Apr. 28, 1972, Ser. No. 248,567

Claims priority, application Great Britain, Apr. 30, 1971, 12,310/71

Int. Cl. G06f *3/00*

U.S. Cl. 340—172.5 **4 Claims**



Access is frequently required between a central processing arrangement and a plurality of peripheral equipments each associated with buffer storage. Control of such access is provided using a local store which has, for each peripheral, two storage locations, one for the control word appropriate to the peripheral and the other as an additional data word buffer. In this way setting up an access is speeded as also is the freeing of common data highways.

3,792,439
STORAGE ARRANGEMENT FOR PROGRAM CONTROLLED TELECOMMUNICATION EXCHANGE INSTALLATIONS

Heinz Auspurg; Dieter Holzerlandt, both of Munich; Hannes Jaeger, Icking; Peter Kern, Munich; Hans-Ulrich Moder, Munich; Rolf Schubert, Munich; Hans Bittermann, Munich; Josef Huber, Munich, and Bernhard Schaffer, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 6, 1970, Ser. No. 61,692

Claims priority, application Germany, Aug. 19, 1969, P 19 42 189.7

Int. Cl. G06f *9/18*

U.S. Cl. 340—172.5 **7 Claims**

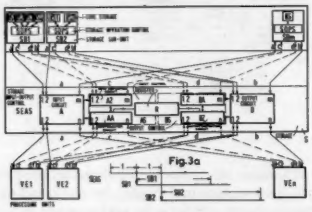


Fig.3a

A message exchange system for binary data signals wherein circuit means are provided for subscriber interconnection as well as computer interconnection. Storage means are provided for the data and programs needed for operating the exchange. A storage unit containing a plurality of storage sub-units is assigned to several data processing units in such a way that each processing unit has an individualized program control. Each of the processing units may be connected individually to a separate storage sub-unit. The aforementioned program control may be controlled either by permanently wired commands or commands in the storage means.

3,792,440
COORDINATE INDICATION DEVICE ON MICROFILM

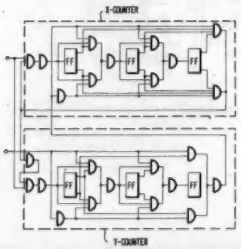
Makoto Murakoshi, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 4, 1971, Ser. No. 195,723

Claims priority, application Japan, Nov. 4, 1970, 45/96481

Int. Cl. G03b *23/08*

U.S. Cl. 340—172.5 **2 Claims**



A microfilm includes plural frames arranged in a two dimensional array, in which information is recorded on each frame. Clock pulses are utilized for representing the consecutive numbers which indicate the position of frames. An X counter counts the clock pulses to provide the X coordinate of the coordinate corresponding to the position of the desired frame. A Y counter counts the carry signals of the X counter to provide the Y coordinate. The X counter may be a reversible counter. Further, when the information is recorded on plural sheets of microfilm, i.e., with three dimensional extension, a Z counter counts the carry signals of the Y counter to indicate the sheet number of the microfilm. Thus, the coordinates of the desired frame are indicated with the outputs of the above counters.

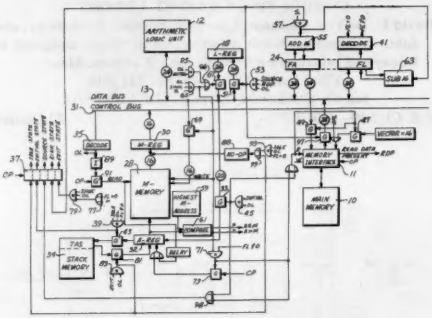
3,792,441
MICRO-PROGRAM HAVING AN OVERLAY MICRO-INSTRUCTION

Charles E. Wymore, Santa Barbara, and Paul R. LeCain, Goleta, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Mar. 8, 1972, Ser. No. 232,880

Int. Cl. G06f *9/16*

U.S. Cl. 340—172.5 **3 Claims**



There is described a micro-programmed data processor having, in addition to the main memory, a memory for currently used strings of micro-operators in which any portion of the latter memory can be overlayed from main memory by a unique micro-instruction that is handled as one more micro step in whatever micro-string is being executed. Once the overlay is complete, the next micro-operation in sequence is executed. This micro-operator may be from the previously stored micro-operator string or from the overlayed instructions, depending upon where the overlay is positioned in the memory.

3,792,442
APPARATUS FOR CONTROLLING THE TRANSFER OF DATA FROM CORE TO DISC STORAGE IN A VIDEO DISPLAY SYSTEM

Gerard D. Koeijmans, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

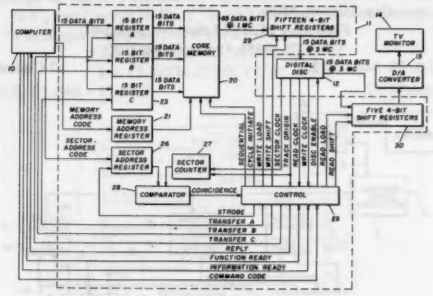
Continuation-in-part of Ser. No. 85,761, Oct. 30, 1970, Pat. No. 3,742,289, which is a continuation of Ser. No. 812,213, April 1, 1969, abandoned. This application June 15, 1972, Ser. No. 263,325

Int. Cl. G11b *13/00*

U.S. Cl. 340—172.5 **4 Claims**

A video display system comprises a memory for storing digital data, a digital disc for recording digital data, a digital-to-analog converter for converting digital data to an analog video signal, and a TV monitor for displaying analog video signals. An interface controller controls the transfer of a sector address from the computer into a sector address register in timed relationship with a clock pulse from the disc storage unit, such clock pulse indicating that the disc storage unit has been rotated to its starting position adjacent the magnetic

write heads. When the disc storage unit is thereafter rotated to the angular position represented by the sector address, data is



transferred by way of the magnetic write heads from the computer to disc storage. A reply signal is then sent to the computer, indicating that the transfer of data has taken place.

3,792,443

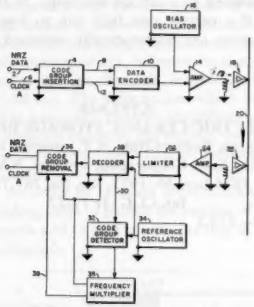
RECORDING AND PLAYBACK SYSTEM FOR SELF-CLOCKING DIGITAL SIGNALS

Ivars P. Breikss, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 14, 1972, Ser. No. 244,059

Int. Cl. G11b *5/00;* **H03k** *5/20*

U.S. Cl. 340—172.5 **4 Claims**



A recording and reproducing system for recording input digital data in a self-clocking encoded format and periodically inserting synchronizing words in the digital data stream and for reproducing the recorded data in its original format by decoding the reproduced signal while removing the inserted synchronizing words from the decoded signal.

3,792,444

DATA COMMUNICATION SYSTEM

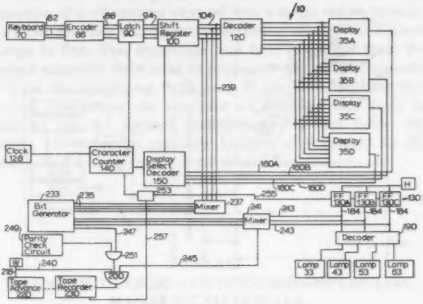
Robert E. Spinner, 26 Deer Trail Rd., North Caldwell, N.J.

Filed Sept. 18, 1972, Ser. No. 290,120

Int. Cl. G08b *5/00*

U.S. Cl. 340—172.5 **13 Claims**

The system includes a case having a plurality of display portions, each of which can display a unit of information in a predetermined sequence. The system also includes a keyboard for generating said numerical units of information, a counter for controlling the sequencing of the display portions, and a shift register for storing the units of information before entering them on tape. The counter is connected to sequence through the various display portions serially and to lock at two selected display portions which are operated back and forth along with the proper associated units of information.



The system also includes means for reading back the stored information from the tape and for transmitting the information to a remote computer or other data center.

3,792,445

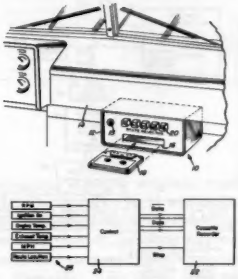
VEHICLE DATA RECORDING SYSTEM

Robert M. Bucks, Norristown, and Frederick M. Ayars, Lansdale, both of Pa., assignors to Mark & Son, Ltd., Palm Beach, Fla.

Filed Dec. 1, 1972, Ser. No. 311,140

Int. Cl. G11b *13/00;* **G01d** *9/28*

U.S. Cl. 340—172.5 **8 Claims**



A vehicle data recording system comprising a plurality of vehicle condition sensors and a route location selector which furnish corresponding digital data which is processed and periodically fed to a magnetic tape cassette recorder, or the like, for recording on magnetic tape. The magnetic tape is advanced only periodically and the data is recorded without significant gaps between the words, such that several days of data may be recorded on a single tape cassette for subsequent storage or analysis.

3,792,446

REMOTE POSTAGE METER RESETTING METHOD

Robert B. McFiggins, Stamford, and Alton B. Eckert, Jr., Norwalk, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

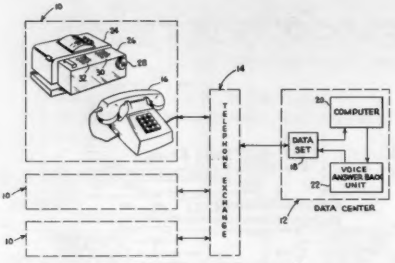
Filed Dec. 4, 1972, Ser. No. 311,921

Int. Cl. G06f *9/18*

U.S. Cl. 340—172.5 **10 Claims**

A data center equipped with a programmed digital computer and a voice answer-back unit processes telephone calls

from users of postage meters equipped with combination locks, wherein each lock inhibits recharging of its associated meter with an additional postage increment while locked and its combination changes in random sequence with each actuation to enable meter recharging. The computer operates via the answer-back unit to voice communicate with the caller in requesting the input of data uniquely identifying the caller and the postage meter to be recharged pursuant to issuing the next combination.

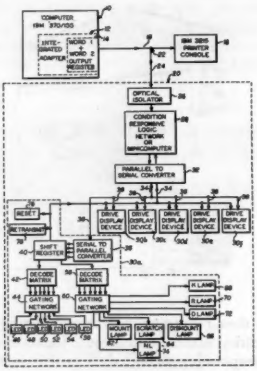


3,792,447

DISPLAY DEVICE CONTROL SYSTEM

John P. Beltz, Willingboro, N.J., and Timothy P. Ahlstrom, Larchmount, N.Y., assignors to Ahlstrom, LaMarche & Co., Inc., New York, N.Y.

Filed Mar. 12, 1973, Ser. No. 340,198
Int. Cl. G06k *15/18*; **G06f** *5/04, 11/08*
U.S. Cl. 340—172.5 **19 Claims**



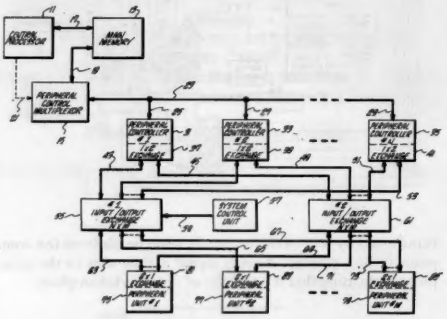
An operator display device control system for use with a computer data input device such as a tape drive or a disc driver intercepts an IBM OS hard copy printing instruction or message control signal to a printer or cathode ray tube operator console and provides a simplified visual display of the instruction with the appropriate tape or disc volume serial no. at the appropriate tape or disc drive for a plurality of such drives while still enabling the hard copy printing instruction to pass to the printer or cathode ray tube console for a substantially simultaneous printing thereof at the centrally located console. The display device control system includes a plurality of these display devices which enables the individual instructions to be displayed at the tape or disc drives to which the operator control instructions pertain as well as enabling the hard copy printing of the instruction at a central console.

3,792,448

FAILSOFT PERIPHERAL EXCHANGE

Walter Scott Bennett, Diamond Bar, and Jacob Frank Vigil, Sierra Madre, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed May 21, 1973, Ser. No. 362,249
Int. Cl. G05b *19/00*; **H04q** *3/00*
U.S. Cl. 340—172.5 **17 Claims**



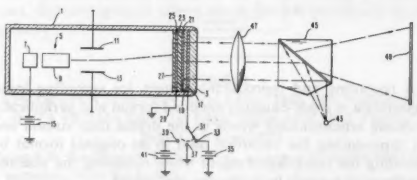
In a computer system, use of two or more I/O exchanges between peripheral controllers and serial peripheral units, such as disk files, disk packs and tape drives, provides redundant communication paths that can be made available for communication between the N controllers and the M peripheral units. All peripheral controllers and units are connected to each exchange. Each controller and unit may be manually assigned to a certain exchange. In the case of two exchanges, if a certain one fails due to loss of power, all peripheral units are automatically assigned to the other exchange.

3,792,449

FERROELECTRIC CERAMIC STORAGE DISPLAY TUBE

Benjamin Kazan, Bedford Hills, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1972, Ser. No. 267,750
Int. Cl. G11c *11/22*
U.S. Cl. 340—173.2 **7 Claims**



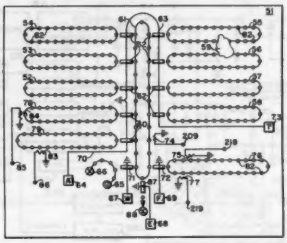
A ferroelectric ceramic is mounted within a CRT in a "strain-biased" state, so that it is birefringent. A reflective layer is mounted adjacent the ceramic, and a photoconductive layer is mounted adjacent the reflective layer. With a potential applied across the ceramic-photoconductive layer combination, an image written upon regions of a phosphor target adjacent the photoconductive layer by an electron beam, results in the flow of local charge through corresponding regions of the ceramic, thereby changing the polarization thereat. The flow of polarization charge acts to modulate the birefringence in the ceramic, in accordance with the pattern of the image. A corresponding pattern of brightness is then projected upon an external screen. A "scattering mode" arrangement is also employed.

3,792,450

SYSTEM FOR OVERCOMING FAULTS IN MAGNETIC ANISOTROPIC MATERIAL

Joseph E. Bogar, Parsipanny, N.J.; John K. Bragg, New York, N.Y., and George H. Hare, North Caldwell, N.J., assignors to The Singer Company, New York, N.Y.

Filed May 8, 1972, Ser. No. 250,944
Int. Cl. G11c *29/00, 11/14, 19/00*
U.S. Cl. 340—174 ED 29 Claims



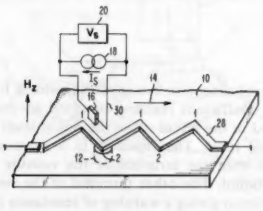
Mass memories using magnetic domain storage devices suffer from the large number of flaws found in the storage medium. This invention comprises a system for identifying and isolating those channels in a mass memory medium which contain flaws and for controlling the storage of information in the medium to avoid those channels. The system comprises the storage material having, in addition to the normal information storage registers, additional registers which contain the identification of those storage channels which contain flaws. This identification is in the form of bits of data whose movements are synchronized with the movements of the information stored in the memory, and which identification blocks the transfer of information into defective channels. During the initial testing of the mass memory, information is stored in each of the information storage channels, and that information is subsequently read out. The information which is read out is used as a word in a separate channel identification register to identify those channels which do not contain flaws. The information stored in the channel identification register is read during normal circulation of information through the transfer loop, and the presence of channel identification in that register opens loading gates to permit the loading of information into good channels and to prevent the loading of information into defective channels.

3,792,451

NON-DESTRUCTIVE SENSING OF VERY SMALL MAGNETIC DOMAINS

George S. Almasi, Purdy Station; George E. Keefe, Montrose, and Yeong S. Lin, Mt. Kisco, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 16, 1970, Ser. No. 89,964
Int. Cl. G11c *11/14, 19/00*
U.S. Cl. 340—174 EB 6 Claims



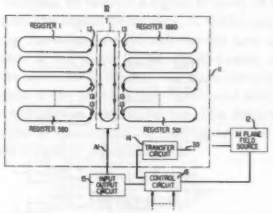
A magneto-resistive sensing technique for detection of very small single-wall magnetic domains. An apparatus is provided in which magneto-resistive sensing elements are located on a magnetic material capable of supporting single-wall magnetic domains (bubble domains). Since very small bubble domains have only small amounts of magnetic flux associated with them, a transverse magnetic bias field is used to move the operation of each sensing element into a linear region to maximize the sensor's incremental resistance change for a given change in flux. This transverse bias field is derived from the applied magnetic field used to propagate the bubble domains or from the stabilizing field used to stabilize the domains, thereby eliminating the need for an auxiliary bias field. In order to use the applied propagation and bias fields, the sensing elements are precisely located with respect to the propagation means, and have particular orientations.

3,792,452

MAGNETIC DEVICES UTILIZING ION-IMPLANTED MAGNETIC MATERIALS

Melvyn Dixon, Allentown, Pa.; Robert Alan Moline, Gillette, N.J.; James Clayton North, New Providence, N.J.; Lawrence John Varnerin, Jr., Watchung, N.J., and Raymond Wolfe, New Providence, N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed June 10, 1971, Ser. No. 151,728
Int. Cl. C11c *11/14*
U.S. Cl. 340—174 TF 22 Claims



Magnetic anisotropy in oxidic magnetic materials is altered by strain which is induced by local expansion of the lattice through ion implantation. This compressional strain in the instance of a material having positive magnetostriction may result in an enhanced magnetic easy direction normal to a major surface. Exemplary rare earth iron garnet materials have been so processed as to result in a thin surface region having appropriate magnetic properties for incorporation in "bubble" devices.

3,792,453

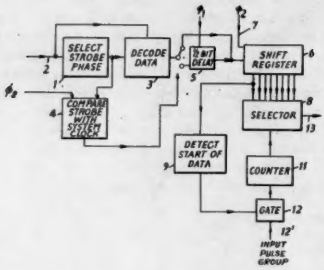
DATA STORAGE SYSTEMS

Christopher Paul Relf Smith, Bishampton, England, assignor to Sperry Rand Limited, London, England

Filed Nov. 3, 1971, Ser. No. 195,417
Claims priority, application Great Britain, Nov. 5, 1970, 52652/70
Int. Cl. G11b *5/02*
U.S. Cl. 340—174.1 A 4 Claims

Apparatus for use in a data storage system having a parallel read mode and which comprises, for each track of a recording medium from which data is to be read simultaneously, storage means for storing data to be read, and means for extracting data from the data storage means at a predetermined instant

such that data from each track is available for reading simultaneously. Thus the reading of data is effected by first recover-



ing data from each track concerned and then aligning the data timewise for onward transmission to readout.

3,792,454

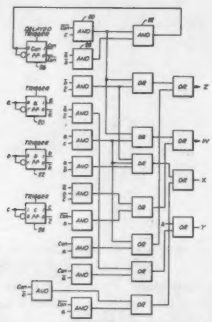
MAGNETIC STORAGE SYSTEM USING ALTERNATE CODES TO REDUCE WRITE CURRENT BIAS

James P. Lipp, Oklahoma City, Okla., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jan. 3, 1972, Ser. No. 215,978

Int. Cl. G06f *15/34*; G06g *7/19*

U.S. Cl. 340—174.1 G **12 Claims**



A magnetic storage system which reduces the DC bias of magnetic write current by using alternate codes to represent certain triplets of binary signals where one of those triplets sequentially follows certain occurrences of a control triplet of binary signals. The DC bias required to write an alternate code is either zero or of a polarity which offsets the DC bias required to write the code representing the control triplet.

3,792,455

SECURITY ALARM SYSTEM WITH FREQUENCY SWEEPING

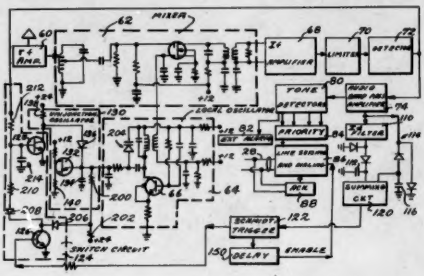
Darryl H. Phillips, Sunrise, Fla., assignor to Owen M. Ward, Key Biscayne, Fla.

Filed Sept. 15, 1972, Ser. No. 289,533

Int. Cl. H04b *1/16*; H04q *1/42*

U.S. Cl. 340—224 **12 Claims**

A system for providing an alarm upon detection of an alarm condition such as intrusion, fire, etc., having a number of sensors which each produce and transmit an rf signal modulated by an identification frequency audio signal unique to the protected facility and a combination of audio frequency signals defining the sensor function and a central alarm control which receives the rf signal and communicates via telephone lines with a central station. In order to eliminate the need for precisely tuning the rf frequency at each sensor and maintaining the rf frequency constant, the alarm control includes a



unijunction oscillator circuit which varies a local oscillator connected to a mixer circuit, which forms part of a superhetrodyne receiver, between preset limits to sweep continuously. When an identification frequency signal of sufficient amplitude is detected, an electronic switch is operated to disable the unijunction oscillator and lock the system at the rf frequency onto which the detected identification frequency is modulated.

3,792,456

LIQUID LEVEL DETECTION SYSTEMS

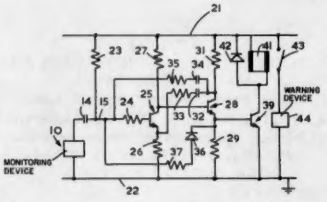
William Frank Hill, Stafford, England, assignor to Joseph Lucas (Electrical) Limited, Birmingham, England

Filed July 28, 1972, Ser. No. 276,038

Claims priority, application Great Britain, Sept. 18, 1971, 43621/71

Int. Cl. G08b *21/00*

U.S. Cl. 340—244 R **2 Claims**



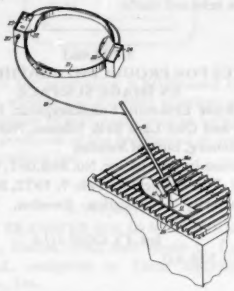
A liquid level detection system for a vehicle has a positive temperature coefficient resistor mounted so that it is thermally coupled to the liquid when the liquid level is above the predetermined level. The liquid is in a container which is grounded, so that one terminal of the resistor is grounded through the liquid. The other terminal of the resistor is connected to a circuit giving a warning of resistance if the resistor changes as a result of excessive temperature rise of the liquid, or if the impedance to earth is substantially increased as a result of low liquid level.

3,792,457

DETECTION DEVICE FOR INDICATING SHORT CIRCUITS IN ELECTROLYTIC CELLS

Frederick E. Templeton; William M. Tuddenham; Veloy H. Butterfield, Jr., and Barton F. Shipley, all of Salt Lake City, Utah, assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Jan. 5, 1972, Ser. No. 215,508
Int. Cl. G08b 21/00
U.S. Cl. 340—253 A **12 Claims**



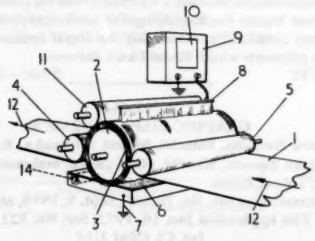
An electrical unit for sensing a steady magnetic field intensity produced by the flow of direct current is mounted in a carriage a fixed distance from the running surface of the carriage and is electrically connected in circuit with indicating means, which may be visual means, such as a light, or an audible alarm or both, energized in response to the sensing of a magnetic field of intensity greater than is produced by electrical current flow of up to a predetermined normal maximum amperage. The carriage is preferably of sled formation adapted to be pushed or pulled across a multitude of electrode suspension bars arranged in series along electrolytic cells in an electrolytic tank house, which bars serve to conduct current to the electrodes. The sensing unit is advantageously a magnetodiode, but may be any one of a number of possible alternatives, e.g. reed relays, electrically connected in suitable control circuitry.

3,792,458

METHOD AND APPARATUS FOR DETECTING PINHOLES IN SHEET MATERIAL

John Edwin Latham Smith, Horsham, and Philip Henry Witheridge, Gretton Fields, near Winchcombe, all of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Dec. 15, 1971, Ser. No. 208,341
Claims priority, application Great Britain, Jan. 8, 1971, 1052/71
Int. Cl. G08b 21/00
U.S. Cl. 340—259 **8 Claims**



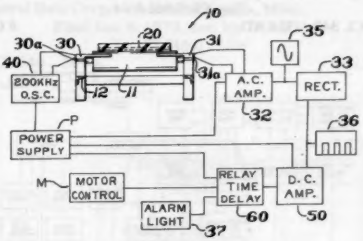
Non-conductive sheet material is tested for holes by applying a liquid under pressure to one side of the material. The liquid is used as one electrode and if any holes are present in the material passes through to make a conductive path with an electrode on the other side of the material. The current passing can be detected and used to operate a marker onto the sheet.

3,792,459

CONVEYOR BELT RIP DETECTOR

Frank D. Snyder, 715 W. Market, Akron, Ohio

Filed Mar. 20, 1972, Ser. No. 235,915
Int. Cl. B65g 43/02; G08b 21/00
U.S. Cl. 340—259 **10 Claims**



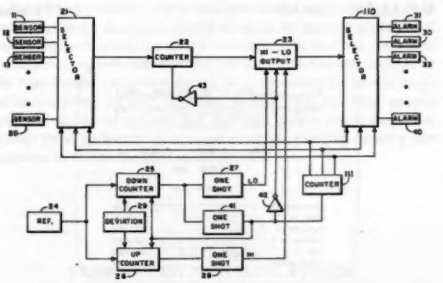
A plurality of longitudinally spaced conductors is embedded in a non-metallic endless conveyor belt with each conductor extending transversely the width of the belt. A stationary signal generator is disposed along one edge of the belt and capacitively coupled to induce a signal in each of the conductors as they pass the signal generator. A stationary detector is disposed along the edge of said belt on the side opposite the signal generator at the same longitudinal station as the signal generator. The detector is electrically capacitively coupled to detect the signal in the passing conductor and detect a belt rip due to a discontinuity in the conductor. The detector is operatively connected to deactivate the conveyor drive mechanism and to activate a light or other alarm.

3,792,460

SHAFT SPEED MONITORING CIRCUIT

James W. Ratz, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 13, 1972, Ser. No. 297,568
Int. Cl. G08b 21/00
U.S. Cl. 340—271 **8 Claims**



A shaft speed monitoring system comprises a plurality of sensors for sensing the speeds of a plurality of shafts, each sensor producing output pulses the frequency of which is determined by the rate at which its associated shaft rotates, a reference pulse source, a comparator circuit, a selector circuit

for selecting a particular sensor such that the comparison circuit can compare the output from the selected sensor to the output of the reference pulse source and a second selector circuit for connecting one of the alarm circuits with its associated sensor for displaying an alarm condition.

3,792,461

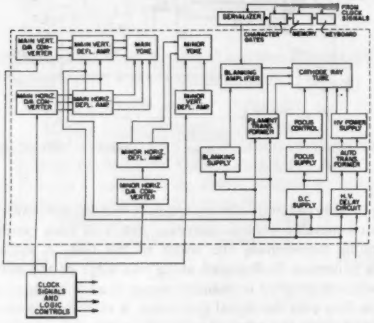
CHARACTER DISPLAY SYSTEM

Duncan E. Cull, and Alvin E. Culbertson, both of Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Division of Ser. No. 836,270, June 25, 1969, Pat. No. 3,668,661. This application June 4, 1971, Ser. No. 150,001

Int. Cl. G06f *3/14*

U.S. Cl. 340—324 AD **5 Claims**



Selected characters each identified by a bit code are advanced serially to a memory. The memory is formatted for control of a cathode ray tube display operating to legibly display all characters in the memory. A major raster traces lines of character positions. A minor raster traces each character in a dot matrix at each character position.

3,792,462

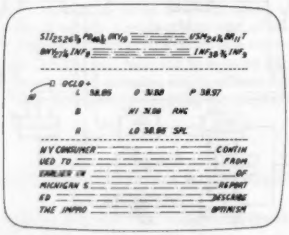
METHOD AND APPARATUS FOR CONTROLLING A MULTI-MODE SEGMENTED DISPLAY

Richard C. Casey, Darien; Robert J. Duggan, Monroe; Stephen A. Grosky, Monroe; Dixon T. Jen, Monroe, and John J. Serra, Monroe, all of Conn., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Sept. 8, 1971, Ser. No. 178,728

Int. Cl. G06f *3/14*

U.S. Cl. 340—324 AD **53 Claims**



A method and apparatus for controlling a segmented display on a processor read-out device. An addressable memory is provided for storing segments of information which may be displayed. The addresses of the segments presently being displayed are stored and these addresses are utilized to retrieve the information to be displayed in each of the segments.

The segmented display may be presented in a plurality of different modes. A capability is provided for changing the mode being displayed at any given time and for altering the information which is displayed in each of the modes. When there is a change in the mode of display, various functions must be performed. Among these functions may be the positioning of an entry marker, the saving or clearing of a memory segment which may be used for different types of information in different modes, and the chaining together of related segments for the selected mode.

3,792,463

APPARATUS FOR PRODUCING GRAPHIC IMAGES ON AN IMAGE SURFACE

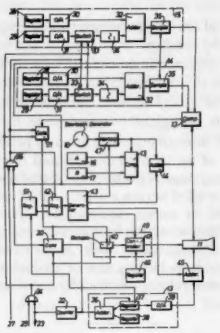
Erik Arivd Rune Eriksson, Faltskarsgatan 12, 42176 Vastra Frolunda, and Olof Lars Erik Nilsson, Nordostpassagen 71, 41311 Goteborg, both of Sweden

Continuation-in-part of Ser. No. 868,061, Oct. 21, 1969, abandoned. This application Feb. 7, 1972, Ser. No. 224,019

Claims priority, application Sweden, Oct. 24, 1968, 14432/68

Int. Cl. G06f *3/14*

U.S. Cl. 340—324 AD **11 Claims**



An apparatus is provided for producing graphic images on an electronically controlled display surface, the images being subdivided into a plurality of area elements a number of which are filled with pattern elements which give each of said area elements a preselected surface representation. The apparatus is operative to store data defining the contour of successive area elements to be reproduced, along with informa-specifying the pattern density of the respective area element. A control circuit responsive to said stored information operates to determine the position of the first of said pattern elements within the respective area element, and thereafter successively determines the position of the remaining pattern elements within the respective area element. The apparatus further comprises means for modifying the surface representation of each area element by controlling the visual appearance of the pattern elements which fill said area element.

3,792,464

GRAPHIC DISPLAY DEVICE

Nagaharu Hamada, Hitachi; Motosi Miyanaka, Kumage-gun, and Isao Yasuda, Hitachi, all of Japan, assignors to Hitachi Ltd., Tokyo, Japan

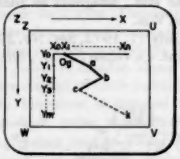
Continuation of Ser. No. 70,663, Sept. 9, 1970, abandoned. This application Jan. 10, 1973, Ser. No. 322,540

Int. Cl. G06f *3/14*

U.S. Cl. 340—324 AD **17 Claims**

A graphic display device for displaying a desired pattern on the screen of a cathode ray tube utilizing a raster of scanning

lines. Means are provided for computing both starting and stopping positions on each scanning line for the desired pattern display in accordance with given information. Based on the results of the computation, a signal is delivered to the



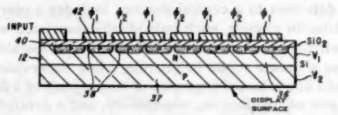
cathode ray tube for generating a brightened or unblanked line between the starting and stopping positions to form a display, the start position of each scanning line being determined by the scanning positions of the brightened or unblanked line of the previous scanned line.

3,792,465

CHARGE TRANSFER SOLID STATE DISPLAY

Dean R. Collins, Dallas, Tex., and David L. Carter, Upper Montclair, N.J., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 30, 1971, Ser. No. 214,367
Int. Cl. H01l *17/00*
U.S. Cl. 340—324 R **14 Claims**



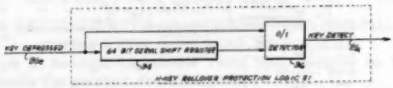
A solid state display includes a semiconductor charge shift register. The semiconductor substrate is formed to define a p-n junction in a plane parallel to the display surface. Information to be displayed is read into respective bits of the shift register in the form of minority carriers. The p-n junction is reversed biased to near avalanche. The minority carriers are transferred from the potential wells towards the p-n junction, triggering the avalanche, providing increased light output. In one aspect of the invention, a hetero-junction structure is provided for the substrate where silicon is used as the semiconductor charge shift register material and a semiconductor having good light emitting characteristics, such as a direct energy gap semiconductor material, is used to effect the display.

3,792,466

KEYBOARD ENTRY SYSTEM WITH N-KEY ROLLOVER AND N-KEY LOCKOUT PROTECTION

Edward H. Arnold, King of Prussia, and Donald L. McLaughlin, Newtown Square, both of Pa., assignors to MOS Technology, Inc., Valley Forge, Pa.

Filed May 31, 1972, Ser. No. 258,389
Int. Cl. G06f *3/02*
U.S. Cl. 340—365 E **25 Claims**



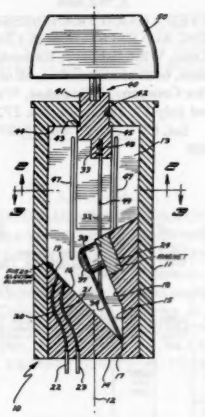
A keyboard entry system having a keyboard encoder array which scans a keyboard matrix in successive scan cycles to detect depressed keys and to generate an output in the form of a multibit code corresponding to each newly depressed key. The keyboard encoder array includes N-key rollover protection logic and N-key lockout logic. The N-key rollover logic properly interprets the depression of each new key regardless of the number of other keys which have been previously depressed and are still held in their depressed states. The N-key lockout logic validates the data representing a depressed key only if two or more keys have not been depressed within the same or within consecutive scan cycles.

3,792,467

IMPACT TRANSDUCER APPARATUS

Xavier De Saint Sauveur, Verney Voltaire, France, assignor to Control Data Corporation, Minneapolis, Minn.

Filed Jan. 8, 1973, Ser. No. 321,873
Int. Cl. H04l *15/06*
U.S. Cl. 340—365 A **10 Claims**



An impact transducer apparatus comprises a lever means supported within a housing adapted to pivot between first and second positions. A hammer is attached to the lever means and is adapted to strike a piezoelectric element when the lever means is moved from its first to its second position. A magnetic latch including a magnet member is associated with the lever means for restraining movement of the lever from its first to its second position, and a resilient bias means, having a bent portion, biases the lever means towards its second position. A key reciprocal along an axis is connected to the bias means to increase energy in the bias means so that when the energy in the bias means exceeds a design level associated with the magnetic coupling of the latching means, the latching means releases the lever means and the bias means urges the lever means from its first to its second position, thereby causing the hammer to strike the piezoelectric element.

3,792,468

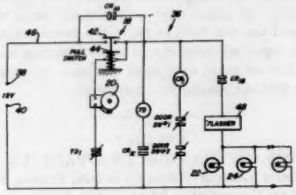
VEHICLE EXIT SIGNALING SYSTEM

Horace V. A. Bryan, 2836 W. 33rd St., Brooklyn, N.Y.

Filed Aug. 31, 1972, Ser. No. 285,359
Int. Cl. G08b *27/00*
U.S. Cl. 340—326 **8 Claims**

A vehicle exit signaling system comprising audio signal means for actuation by vehicle passengers to initially signal the vehicle driver that the passenger wishes to disembark,

visual signal means for reminding the driver to dispatch the passenger subsequent to operation of the audio signal means,



and means responsive to operation of the vehicle exit doors for disabling the visual signal means as the passenger disembarks.

3,792,469

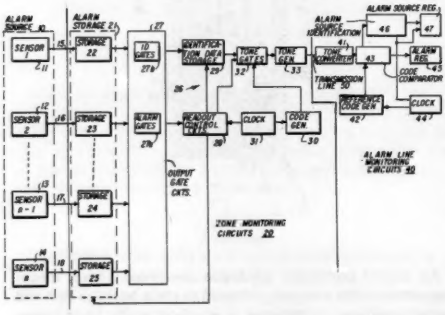
MULTIPLEXED ALARM TRANSMISSION SYSTEM HAVING ALARM STORAGE CIRCUITS

Michael B. McLean, Whitefish Bay; Ramesh Krishnaiyer, and Allen Rasmussen, both of Milwaukee, all of Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed July 17, 1972, Ser. No. 272,541

Int. Cl. G08b *25/00, 26/00*

U.S. Cl. 340—409 **15 Claims**



An alarm transmission system for transmitting alarm information provided by a plurality of alarm sources to a central monitor over a common transmission line includes zone monitoring circuits having a code generator for generating a line monitoring code comprised of a continuous sequence of bits, for transmission over the transmission line to the central monitor, alarm storage circuits which provide separate storage locations for storing alarm outputs provided by each alarm source, and alarm readout circuits operable in response to an alarm output provided by an alarm source to complement the next bit of the line monitoring code generated to indicate that an alarm has been provided and to thereafter selectively complement successive bits of the line monitoring code generated to represent the source of the alarm. Alarm line monitoring circuits at the central monitor include a code comparator which compares each bit of the line monitoring code with bits of a reference code comprised of a sequence of code bits in which each bit is normally identical with a corresponding bit of the line monitoring code at any given time. Whenever a bit of the line monitoring code differs with the corresponding bit of the reference code, an alarm indication is provided at the central monitor, and alarm source identification circuits are enabled to scan subsequent bits of the line monitoring code to determine the source of the alarm.

3,792,470

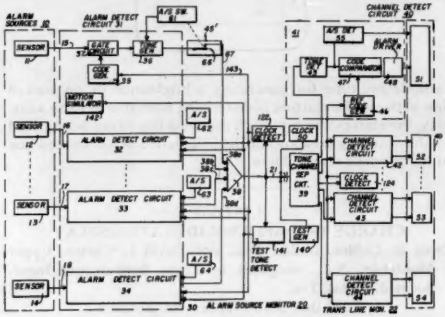
CODED TONE MULTIPLEXED ALARM TRANSMISSION SYSTEM

John C. Donovan, Whitefish Bay; Carl F. Klein, Milwaukee; Lawrence B. Korta, Milwaukee, and Ramesh Krishnaiyer, Milwaukee, all of Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed July 17, 1972, Ser. No. 272,542

Int. Cl. G08b *25/00, 26/00*

U.S. Cl. 340—409 **26 Claims**



A frequency multiplexed alarm transmission system for transmitting alarm information provided by a plurality of intrusion detectors to a central monitor includes a plurality of alarm detector circuits, each individually associated with one of the intrusion detectors and each selectively operable in an access or a secure mode to provide a line supervision code comprised of a selected sequence of tone signals of a first or a second pair of frequencies, respectively, and a control circuit controlled by the corresponding intrusion detector to modify the tone sequence being provided by the associated alarm detector to indicate an intrusion of a corresponding protected area, different alarm detector circuits providing tone sequences having signals of different frequencies to enable simultaneous transmission of the line supervision codes to the central monitor over a common transmission line, line monitoring circuits at the central monitor include an individual tone detector for each alarm detector circuit for receiving the line supervision code sequences provided by the associated alarm detector circuit, the tone detectors being responsive to a modified line supervision code of the first pair of frequencies to indicate the detection of an authorized intrusion of the corresponding protected area and responsive to a modified line supervision code of the second pair of frequencies to indicate the detection of an unauthorized intrusion of the corresponding protected area.

3,792,471

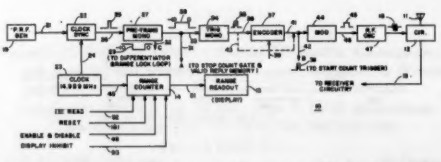
RADAR RANGE LOCK LOOP

Keith M. Kingsbury, 2415 N. 38th St., Phoenix, Ariz.

Filed May 8, 1972, Ser. No. 251,276

Int. Cl. G01s *9/14*

U.S. Cl. 343—7.3 **14 Claims**



There is disclosed a radar tracking system wherein a range measurement is obtained by measuring the interval between

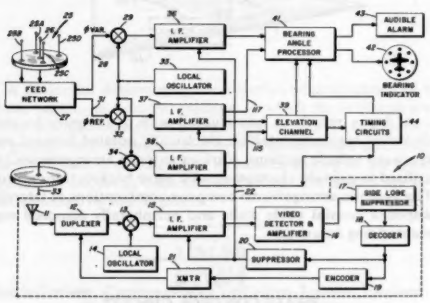
the transmission of an interrogating pulse and the receipt of a reply pulse from a transponder. A single range gate pulse is generated by analogue means and the range measurement is terminated by the coincident arrival of the leading edge of the first of a coded reply pulse and the range gating voltage pulse at the input of a range lock loop. The range lock loop functions to maintain a predetermined minimum overlap between the leading edge of the reply pulse and the trailing edge of the range gate voltage pulse. A disable signal is applied to the range lock loop after receipt of each pulse that coincides with the range gate pulse. However, to prevent excessive disabling by unsynchronized high pulse repetition frequency interference or jamming pulses, and to allow the loop to remain locked to the desired signal in the presence of this interference, all disable signals are overidden (ignored) for a predetermined time period following receipt of each valid pulse. The range lock loop is re-enabled by sensing the presence of valid pulse information in a memory. The memory is disabled after each sensing of the state of the memory flip-flop and is reenabled by the storage in its memory of the next succeeding valid pulse.

3,792,472

WARNING INDICATOR TO ALERT AIRCRAFT PILOT TO PRESENCE AND BEARING OF OTHER AIRCRAFT

Delmar V. Payne, Ferndale, and Wilfried G. Jaeckle, Birmingham, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Aug. 14, 1972, Ser. No. 280,308
Int. Cl. G01s *9/56*
U.S. Cl. 343—6.5 LC **20 Claims**



A pilot warning indicator which operates in cooperation with the ATCRBS to produce an indication of the presence and bearing of other aircraft at substantially the same altitude as the equipped craft. A spiral-phase field antenna array together with a digital phase comparator utilizes transponder reply signals from other aircraft to ground interrogations to provide bearing indications. Amplitude comparisons are made between transponder reply signals received by omni-directional antennas mounted on the top and bottom of the aircraft fuselage to eliminate warnings of aircraft flying at substantially different altitude than equipped craft.

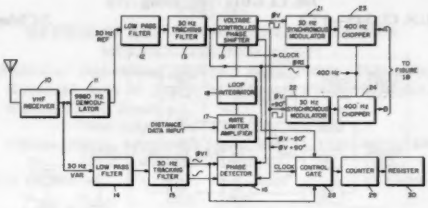
3,792,473

VOR RECEIVER WITH ADAPTIVE FILTERS AND PHASE SHIFTER FOR IMPROVED ACCURACY

Joseph J. Sawicki, Lighthouse Point, Fla., assignor to The Bendix Corporation, Southfield, Mich.

Filed Nov. 21, 1972, Ser. No. 308,393
Int. Cl. G01s *1/44*
U.S. Cl. 343—106 R **15 Claims**

An improved VOR receiver which includes adaptive band pass filters for the 30 Hz reference and variable signals and an electronic phase shifter for shifting the variable and reference signals into phase coincidence, the amount of phase shift thus introduced being a measure of VOR bearing angle. The phase shifter is controlled by a feedback loop having a limiter which



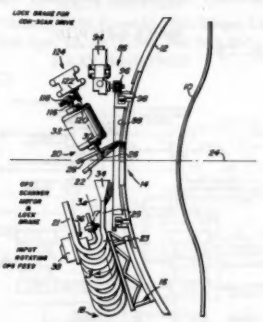
controls the rate of change of phase shift as a function of distance from the VOR station thereby reducing effects of scolloping in the beam of the VOR transmitter upon bearing indications.

3,792,474

SCHWARZSCHILD RADAR ANTENNA OPERABLE IN SECTOR SCAN AND CONICAL SCAN MODES WITH ANTI-BLOCKAGE REFLECTOR

James M. Meek, Silver Spring; Clarence F. Ravilious, Rockville, and Whilden G. Heinard, Bethesda, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 26, 1973, Ser. No. 335,878
Int. Cl. H01q *3/20, 19/06, 19/18*
U.S. Cl. 343—756 **10 Claims**

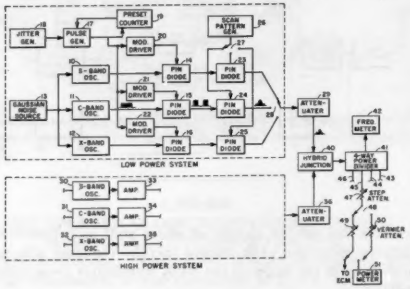


A Schwarzschild radar antenna has an organ-pipe scanner for producing relatively wide angle unidirectional sector scans of a high-gain pencil beam. When conical scanning is desired, energy from selected pipes of the organ-pipe scanner is directed to a nutating mirror that reflects the resulting conical scan to the reflectors of the antenna that reflect conical scan energy to the far field. A rotatable disc behind the main reflector controls the size of the aperture therein and provides decreased blockage when the antenna operates in the conical scanning mode.

3,792,475
RADAR TARGET SIMULATOR

Gary M. Smetana, Endwell, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 9, 1972, Ser. No. 233,065
Int. Cl. G01s 7/40; G06g 7/78
U.S. Cl. 343—17.7 **3 Claims**

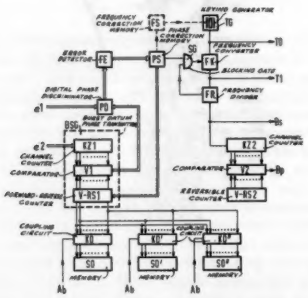


Apparatus is disclosed which simulates the operation of a plurality of radar transmitters so as to permit an evaluation of electronic countermeasure equipment. The system generates sequences of pulsed radio frequency signals whose carrier frequency, modulation, amplitude and power lever are controllable to realistically reflect the signal conditions which may be encountered by an aircraft when a multiplicity of radar emitters are operating simultaneously in its vicinity.

3,792,476
METHOD AND SYSTEM OF COMMUNICATION BETWEEN SEVERAL GROUND STATIONS AND A TRANSPONDER SATELLITE

Josef Domer, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 20, 1971, Ser. No. 135,609
Claims priority, application Germany, Apr. 24, 1970, 2020094
Int. Cl. G01s 9/10
U.S. Cl. 343—7.5 **8 Claims**

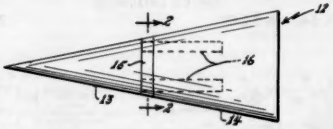


A method of communication between several ground stations and a transponder satellite by time-division multiple access (TDMA) operation, which comprises combining the time-multiplexed and preambled signal bursts of the individual ground stations to a transponder time-division pulse frame; regulating in a reference station the real time position of the station burst in the pulse frame relative to the burst datum phase, deriving the regulating criteria from the pulse frame arriving at the reference station by storing the burst datum position in a burst-position memory and comparing the stored datum position with the burst real position in the arriving pulse frame. This results in a phase-error correction signal which is used for correction of the transmitting phase of the burst issuing from the station. More specifically the regulating criteria are obtained by blocking the regulation (in a main regulating circuit) of the burst transmitting phase toward the transmitting side of the reference station and then restoring the regulation (in an auxiliary regulating circuit) through the burst-position memory of the burst datum phase transmitter to derive therefrom an error signal and transferring to a further memory the error data previously stored into the burst position memory (V-RS1) during the course of a regulating operation. This further memory adds the phase error data over a number of consecutive pulse frames to provide an averaged phase error correction signal from the sum of the error data. The memories are preferably of digital binary type.

3,792,477
DECOY MISSILE WITH ELECTROMAGNETIC WAVE BACKSCATTER CONTROL

Kiyo Tomiyasu, Scotia, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 16, 1969, Ser. No. 826,089
Int. Cl. G01s 9/02
U.S. Cl. 343—18 E **6 Claims**

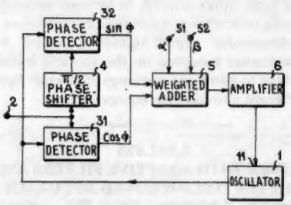


A decoy missile is constructed with a centrally located dielectric region to establish electrically isolated forward and rearward vehicle sections. Various antenna arrangements are utilized to provide electromagnetic wave backscatter control. The antenna arrangements comprise combinations of laterally disposed coaxial cable stubs and peripherally disposed segmented ring antennas.

3,792,478
PHASE CONTROL CIRCUIT

Guy Le Parquier, and Marie-Jacques Jullien, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 7, 1970, Ser. No. 95,494
Claims priority, application France, Dec. 24, 1969, 6944909
Int. Cl. H04b 7/00
U.S. Cl. 343—100 SA **11 Claims**



A circuit for controlling the phase of the output signal produced by an oscillator, by that of a reference signal, while imposing any desired phase shift between the two signals, comprises means for feeding to the oscillator, as control

signal, a signal which is a weighted sum of the sine and of the cosine of the phase difference between the oscillator output signal and the reference signal; the weighting coefficients are determined by the value of the desired phase-shift; the sine and cosine are supplied by a conventional phase detecting means.

3,792,479

DEVICE FOR DETERMINING THE DIRECTION OF PROPAGATION OF A PLANE WAVE

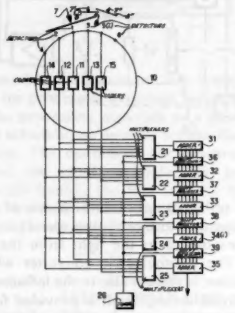
Anne-Marie Faugeras, Paris, and Andre Lambert, Fresnes, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Apr. 21, 1972, Ser. No. 246,414

Claims priority, application France, Apr. 21, 1971, 71.14137

Int. Cl. G01s *3/00*

U.S. Cl. 343—113 R **3 Claims**



A device for determining the direction of propagation of a plane wave in an isotropic medium, in which the detectors are uniformly distributed on a circle. These detectors are disposed in groups each corresponding to a predetermined direction. Each detector is connected to a chain consisting of the same number of adders as detectors in a group. The adders are interconnected by shift registers.

3,792,480

AERIALS

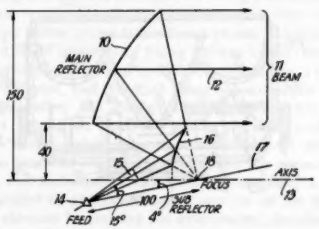
Ralph Graham, Century Works, Lewisham, London, England

Filed Dec. 31, 1968, Ser. No. 790,507

Claims priority, application Great Britain, Jan. 2, 1968, 00274/68

Int. Cl. H01q *19/14*

U.S. Cl. 343—781 **5 Claims**



This disclosure relates to off-set or asymmetric aerial systems in which the main reflector which radiates into or receives from space a beam of energy is disposed to one side of the axis of the geometric body of which the main reflector forms part. The aerial system comprises a feed, a sub-reflector and a main relfector, the feed is displaced from the axis of the main reflector and the axis of the sub-reflector is transverse to the axis of the main reflector. This reduces the phenomena known as "bore-sight jitter" and "frequency sensitive squint."

3,792,481

METHOD OF RECORDING BY HEAT SENSITIVE MULTICOLOR INDICATION

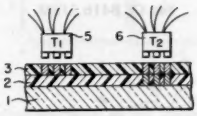
Shinichiro Nagashima, Tokyo, and Toshio Watanabe, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed July 10, 1072, Ser. No. 270,195

Claims priority, application Japan, July 13, 1971, 46/51948

Int. Cl. G01d *15/10*

U.S. Cl. 346—1 **11 Claims**



Heat sensitive recording to produce a multicolor indication is effected by bringing a heating element close to or in contact with a heat sensitive recording material for multicolor indication, the recording material has two or more heat sensitive recording layers. The temperature of the heating element is controlled to produce patterns having different colors depending upon the heat sensitive temperature of each heat sensitive layer.

ERRATA

For Classes 346—20 thru 346—145 see:
Patents Nos. 3,792,493 thru 3,792,496

3,792,482

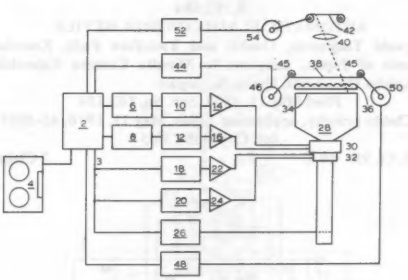
PAGE PRINTER

Asger Torben Nielsen, 3836 Front St., San Diego, Calif.

Filed Apr. 13, 1972, Ser. No. 243,561

Int. Cl. B41b *19/06*

U.S. Cl. 95—4.5 **7 Claims**



A high speed non-impact printing device, that generates characters of high quality on a photosensitive medium in a predetermined page format. A high intensity projection kinescope is utilized as a light source and an aperture and lens array provides substantially parallel light through a moveable character matrix. Transparent Characters on an opaque background are arranged in rows and columns on a matrix, all characters of one row being of the same kind, the number of

rows being equal to the number of different characters in the set and the number of columns being equal to the maximum number of characters per line on the printed page. The matrix is moved one step at a time and all character positions that agree with the desired text are illuminated. A mini computer with sufficient memory capacity to store a page of characters is utilized to control the printing operation.

3,792,483

ARRANGEMENT FOR RECORDING ALPHA-NUMERIC SYMBOLS

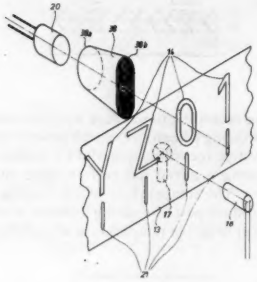
Richard Wick, Munchen; Josef Pfeifer, Unterhaching, and Wilfried Hofmann, Munchen, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed June 5, 1972, Ser. No. 259,866

Claims priority, application Germany, June 5, 1971, 2128038

Int. Cl. B41b *21/08*

U.S. Cl. 95—4.5 **20 Claims**



An endless band has a plurality of symbols spaced at equal intervals and is transported along a predetermined path in the lengthwise direction. A number of sources of illumination are arranged at predetermined positions along the path, each of these sources of illumination illuminating a symbol as it passes by, when said source of illumination is energized. Electronic control means energize the illuminating sources in correspondence to the symbol to be recorded. The film is positioned relative to the sources of illumination to record the so illuminated symbols.

3,792,484

AUTOMATIC FLASH CONTROL DEVICE

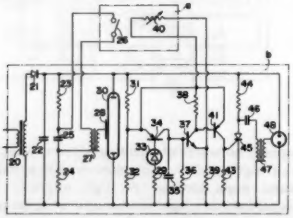
Kayoshi Tsujimoto, Osaka, and Yoshifusa Fujii, Kaizuka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha Osaka-Shi, Osaka-fu, Japan

Filed May 11, 1971, Ser. No. 142,154

Claims priority, application Japan, May 11, 1970, 45-39877

Int. Cl. G03b *15/05*

U.S. Cl. 95—10 C **7 Claims**



An automatic diaphragm aperture control device and an automatic flash control device are combined to effect termination of flash firing by adjusting a threshold level in accordance with a light measuring circuit including a first light receiving element. A second light receiving element in the diaphragm aperture control device adjusts the diaphragm aperture in accordance with the intensity of light and also adjusts the threshold for terminating flash firing in accordance with the light intensity measured by the second light receiving element.

3,792,485

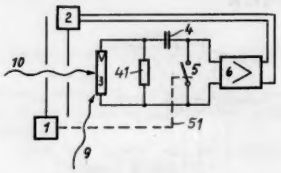
SINGLE LENS REFLEX CAMERA WITH CORRECTION FOR EFFECT OF STRAY LIGHT

Karl-Peter Strauss, Volkmarode, Germany, assignor to Rollei-Werke Franke & Heidecke

Filed Mar. 21, 1973, Ser. No. 343,257

Int. Cl. G03b *7/08;* **G01j** *1/46;* **G03b** *19/12*

U.S. Cl. 95—10 CE **7 Claims**



A single lens reflex camera in which one of the exposure factors (diaphragm aperture or shutter speed) is automatically set by means responsive to the light from the scene to be photographed. The photoelectric converter which receives light from the scene, is subject also to the influence of possible stray light. A circuit arrangement is provided for storing the voltage produced by the stray light falling on the photoelectric converter. Then when the light from the scene to be photographed falls on the photoelectric converter, only the excess of the voltage then produced by stray light plus scene light, over the previously stored voltage produced by the stray light alone, is used in setting the automatically settable exposure factor, thereby compensating for the effect of stray light.

3,792,486

CAMERA-RADIO COMBINATION

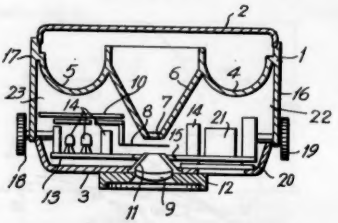
Karl-Heinz Lange, and Hermann Korber, both of Bunde, Germany, assignors to Bloda-Werke, Bunde (Westf), Germany

Filed May 22, 1972, Ser. No. 255,546

Claims priority, application Germany, Feb. 7, 1972, 2205652

Int. Cl. G03b *29/00*

U.S. Cl. 95—12 **10 Claims**



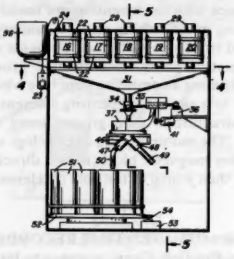
A camera-radio combination. The combination has a conventional camera provided with a camera housing having in its interior spaces which normally would remain empty. A radio receiver has components situated in these spaces.

3,792,487

FILM PROCESSOR

Anthony R. Peres, Bristol, N.Y., assignor to Peres Electronics, Inc., Bristol, N.Y.

Filed Dec. 21, 1972, Ser. No. 317,204
Int. Cl. G03d 3/04
U.S. Cl. 95—99 10 Claims



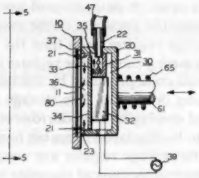
An automatic film processor has temperature-controlled containers for processing materials, solenoid-operated valves to admit the processing materials to a film-holding chamber on a timed schedule, an agitator for the film chamber, and a drain system. The operations are synchronized by a timer switch, and the machine preferably includes a driven mechanism for loading the film into the film chamber, and receptacles indexed under the drain to collect different processing materials after each step of the processing.

3,792,488

FIXING APPARATUS

Noboru Katakabe, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 9, 1972, Ser. No. 279,265
Claims priority, application Japan, Aug. 18, 1971, 46-63148
Int. Cl. G03d 3/00
U.S. Cl. 95—89 G 4 Claims



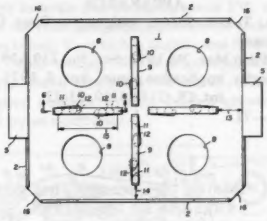
A fixing apparatus is disclosed for fixing a developed visible image on a photoconductive surface of a film whereby a developed visible image is fixed on a photoconductive film by way of a small quantity of fixing solvent vapor. Further, the fixing solvent is easily and quickly evaporated by a low power heating element, and the used fixing solvent vapor is quickly discharged after the fixing. The apparatus has a fixing chamber having an aperture facing the film and an inlet through which fixing solvent is supplied. An evaporating device is mounted on the fixing chamber for evaporating the solvent and includes an evaporating chamber, a radiation plate parallel to photoconductive surface of the film and a heating element for heating the evaporating chamber. An engaging device is provided for moving the film and the chamber relative to each other so as to bring the aperture of the chamber into air-tight engagement with the film. A solvent supply device supplies a predetermined quantity of the solvent to the evaporating device through the inlet. The thus supplied fixing solvent is evaporated to a vapor which acts to fix the developed visible image on the film.

3,792,489

FRAME FOR PROCESSING PHOTOGRAPHIC CUT SHEET FILM

Hugo G. Jelinek, 118 Clearview Dr., Pittsford, N.Y.

Continuation-in-part of Ser. No. 205,062, Dec. 6, 1973, abandoned. This application Jan. 19, 1973, Ser. No. 325,215
Int. Cl. G03d 13/08
U.S. Cl. 95—100 1 Claim



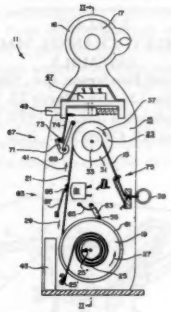
For developing and washing cut sheet film a frame is provided having a generally planar base and four side walls that are separated from one another at their corners. Partitions divide the frame into compartments, one for each sheet to be processed. The base has a plurality of apertures, one for each compartment; and the compartments are slightly wider and longer than the film sheets to permit some very limited movement of the sheets in the compartments; but the walls and the partitions are of a height to retain the film during processing. In use, the frame with the film sheets therein is dipped in a conventional tray containing developer, or water or other processing liquid and moved primarily laterally to cause the liquid to flow into and out of the corners of the frame and between compartments and under and over the sheets therein.

3,792,490

MINIATURE SOUND RECORDING AND REPRODUCING DEVICE

Voorhis F. Wigal, P.O. Box 1542, Jackson, Tenn.

Filed Feb. 1, 1972, Ser. No. 222,618
Int. Cl. G11b 15/32
U.S. Cl. 360—62 3 Claims



A device for recording messages of short duration which may be audibly reproduced repeatedly by simply pulling a cord. The device employs spring power for transporting magnetic tape across a magnetic record-playback head, i.e., being completely void of electric motors or the like. Also included are novel sound recording, reproducing, and amplifying circuitry; switching structure; and structure for erasing the

recorded messages from the tape. A low voltage battery, e.g., three volts, is provided to supply electrical energy to power the recording, reproducing and amplifying circuitry. The device is particularly adaptable for inclusion in a wide variety of items, e. g., dolls, animal figures, etc.

3,792,491

MAGNETIC RECORDING AND/OR REPRODUCING APPARATUS

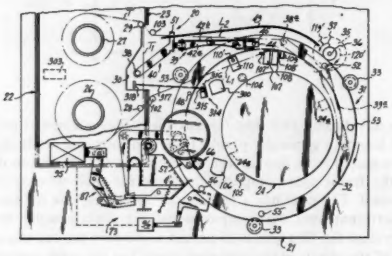
Katsu Inaga, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 30, 1972, Ser. No. 239,639

Claims priority, application Japan, Apr. 8, 1971, 46-26364

Int. Cl. G11b *5/00, 15/32*

U.S. Cl. 360—71 **8 Claims**



In an apparatus for magnetically recording and/or reproducing signals, such as video signals, on a magnetic tape extending between and wound on supply and take-up reels, and in which the tape between the reels is selectively guided in a first path removed from a tape guide drum and in a second path that extends about at least a portion of the guide drum periphery for scanning of the tape by a rotary magnetic head associated with the guide drum; the driving of the tape in each of the first and second paths is controlled by a sensing device which includes a light source and a light detector defining a light path therebetween which is intercepted by each of the first and second tape paths so that the light detector receives or detects light from the source to halt the driving of the tape only when a transparent leader provided at least at one end of the magnetic tape intercepts the light path.

3,792,492

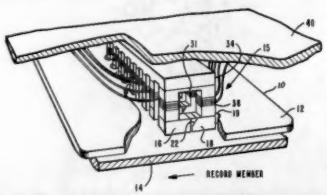
AIR BEARING MULTI-CHANNEL MAGNETIC HEAD ASSEMBLY

Samuel E. Neace, 95440 Henderson Ave., Sunnyvale, Calif.

Division of Ser. No. 126,565, March 22, 1971, Pat. No. 3,722,081. This application Dec. 20, 1972, Ser. No. 316,903

Int. Cl. G11b *5/60, 5/22*

U.S. Cl. 360—103 **7 Claims**



A multi-channel magnetic head assembly for non-contact usage comprises a pair of essentially unitary structures joined along a common plane. A first of the structures comprises a plurality of pole tip elements, formed from a single element and affixed within individual slots to a slotted air bearing element. The individual pole tip elements bridge, at the common plane, individual core legs having a common base and joined to a small circuit board. The arrangement provides precise gap depth, virtually zero gap scatter, and an effective gap length that corresponds to the physical length. The head also minimizes change of head position, and is extremely small and of low mass.

Methods of making multi-channel, non-contact head assemblies in accordance with the invention are based upon readily automated cutting and finishing steps. A unitary pole tip assembly is formed from a pair of block elements with an interposed non-magnetic spacer. Interchannel grooves are cut across the gap, forming a comb-like structure which is inserted into and affixed to a slotted air bearing element. The base of the comb-like structure is then ground away to a selected reference plane. The multiple pairs of core legs are formed by grooving a unitary magnetic block in two directions and this base structure is then joined to the pole tip elements.

3,792,493

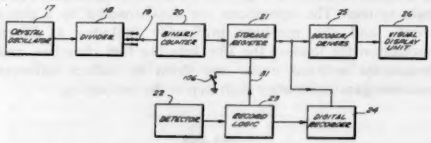
DOOR ACTUATED TIME RECORDER

David C. Hughes, Cos Cob, Conn., assignor to Intelligence Services Products Division, Inc., Syosset, N.Y.

Filed Nov. 6, 1972, Ser. No. 303,904

Int. Cl. G07c *1/10*

U.S. Cl. 346—20 **12 Claims**



A security system for detecting the opening or closing of the door of an enclosed area incudes an enclosure having a digital clock which drives a binary register, the binary register providing a binary decimal code a measure of time. The door includes a fin having a pair of magnets which enter a slot in the enclosure when the door is closed and are removed therefrom when the door is open. A detector and associated circuitry in the enclosure sense the presence of the magnets and provides a signal to a storage register each time the door is opened or closed, thereby causing the storage register to sample and hold the binary decimal code provided by the binary register at the time of an opening or closing. The storage register is coupled to an illuminated display by decoder/drivers, thereby causing the stored time to be displayed in arabic numerals. In addition, the outputs of the storage register are coupled to the writing styluses of an electromechanical recorder in the enclosure. A motor in the recorder, in response to the detection, moves a voltage sensitive paper under the styluses, thereby causing the stored time to be recorded in binary decimal code on the paper. Thus, each opening or closing of the door is recorded. The enclosure includes a transparent window through which several such writings on the paper are visible, and another transparent window through which the illuminated display is visible at a distance.

3,792,494

ELECTROSTATIC STYLUS RECORDING WITH SELF-CLEANING DRUM

Josef Matkan, Malvern, and Kevin Douglas O'Connor, Queenstown, both of Australia, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1971, Ser. No. 136,325

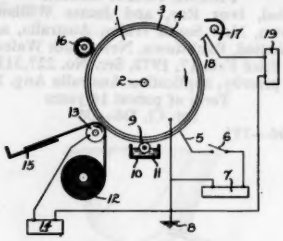
Claims priority, application Australia, May 1, 1970, 1075/70

Int. Cl. G03g *13/22*

U.S. Cl. 346—74 ES **8 Claims**

A method of electrostatic recording using signal energised styli adjacently disposed across the surface of a photoconduc-

tive recording member so that such surface receives a recording potential to form a latent electrostatic image thereon, then rendering the latent image visible by applying electroscopic marking particles, then transferring the image so formed onto



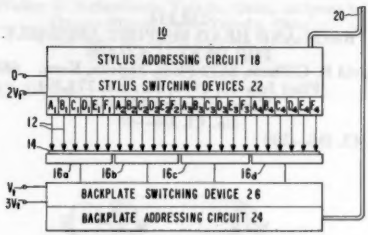
another surface, and cleaning the recording member for further recording by removing residual marking particles and by removing residual electrostatic charges by lowering the electrical resistivity of the photoconductive layer by exposure to activating radiation during a corona discharge.

3,792,495

ELECTROSTATIC RECORDER EMPLOYING THREE VOLTAGE LEVEL SWITCHING BETWEEN THE STYLUS ELECTRODES AND THE BACKPLATE SECTIONS

Arthur E. Bliss, Sunnyvale, and Edward W. Marshall, Saratoga, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Mar. 31, 1972, Ser. No. 240,043
Int. Cl. G01d *15/06*
U.S. Cl. 346—74 ES **7 Claims**



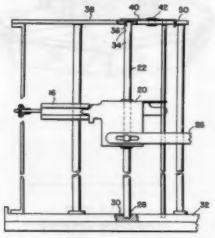
Two backplate voltages and two stylus electrode voltages are provided for an electrostatic recorder employing backplate switching and stylus electrode switching. The magnitudes of the four voltages establish an increasing progression, having a difference therebetween of slightly less than the threshold writing voltage V_T (that voltage required to establish writing in the electrostatic recorder). The difference between the lowest voltage and the second lowest voltage is designated V_t. The difference between the lowest voltage and the third voltage is $2V_t$, and the difference between the lowest and the highest voltage is about $3V_t$. These three voltage differences or levels are established between the stylus electrodes and the backup plates in such a manner that the voltage between the stylus selected to write and its backplate is $3V_t$; and the voltages between the remaining stylus electrodes and the adjacent backup plates is only V_t, which is slightly less than V_T and is insufficient to cause writing. The voltage applied for writing, $3V_t$, is almost three times the threshold voltage V_T, and establishes good contrast writing without ghosting from the non-selected stylus electrodes.

3,792,496

MEANS FOR MOUNTING A PEN DRIVE IN A CHART RECORDER OR THE LIKE

Melvin J. Post, and Kenneth Lee Shelter, both of Rochester, N.Y., assignors to Sybron Corporation, Rochester, N.Y.

Filed Apr. 11, 1973, Ser. No. 349,926
Int. Cl. G01d *11/02*
U.S. Cl. 346—145 **7 Claims**

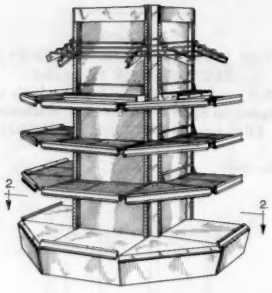


Disclosed is a spring retaining plate for the pen drive of a chart recorder. The rod, which carries the sliding pen or scribe of the recorder, is held at one end in a blind hole in the base of the recorder. The other end of the rod is supported by a bracket, the end of the rod extending into an opening in the bracket. A spring retaining plate flush mounted to the bracket prevents the rod from sliding through the bracket opening. The retaining plate is pivoted to the bracket and also has an opening which aligns with the bracket opening when the plate is pivoted. In this way, the rod can be moved axially at least partly through the bracket opening to free the end of the rod held by the base. Providing a plurality of openings in the bracket and in the plate, permits relatively easy conversion of the recorder from a single to a double or triple pen drive.

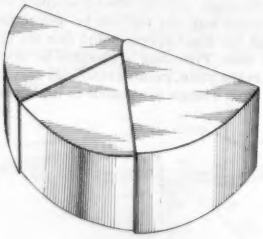
DESIGNS

FEBRUARY 12, 1974

230,331
DISPLAY STAND
Alan K. Snyder, River Forest, Ill., assignor to Chicago Display Company, Melrose Park, Ill.
Filed July 28, 1972, Ser. No. 276,077
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—24

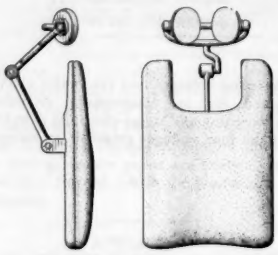


230,332
ARTICULATED TABLE
Maria Cristina Boeri, nee Mariani, Milan, Italy, assignor to Kiga S.p.A., Foligno (Perugia), Italy
Filed Dec. 16, 1971, Ser. No. 209,015
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—178



230,333
FRAME FOR A CHAIR
Harry Sebel, Ivor Rey, and James William Hughes, Bankstown, New South Wales, Australia, assignors to Sebel Limited, Bankstown, New South Wales, Australia
Filed Feb. 17, 1972, Ser. No. 227,312
Claims priority, application Australia Aug. 23, 1971
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191

230,334
BACK AND HEAD SUPPORT ASSEMBLY FOR DENTAL CHAIR
David R. Gillham, 2872 Plass, Topeka, Kans. 66611
Filed July 13, 1972, Ser. No. 271,391
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—200



230,335
BEVERAGE GLASS OR SIMILAR ARTICLE
Walter B. Achenbach, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed July 23, 1971, Ser. No. 165,865
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—8

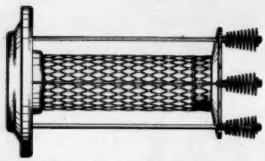
230,336
BEVERAGE GLASS OR SIMILAR ARTICLE
Walter B. Achenbach, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed July 23, 1971, Ser. No. 165,870
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—8

230,337
BEVERAGE GLASS OR SIMILAR ARTICLE
Walter B. Achenbach, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed July 23, 1971, Ser. No. 165,876
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—8

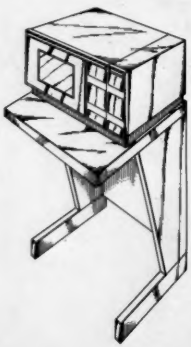
230,338
FOOD TRAY
Oliver R. St. Andre, Chicopee, Mass., assignor to David L. Sokol, Springfield, Mass.
Filed Nov. 6, 1972, Ser. No. 304,122
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—35

230,339
NON-HYGROSCOPIC CONDIMENT DISPENSER
Fred M. Trecartin, 8150 SW. 54th Ave., Miami, Fla. 33143
Filed Apr. 10, 1972, Ser. No. 242,902
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—53

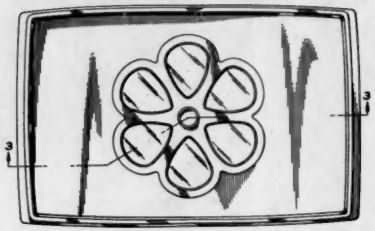
230,340
VERTICAL SOLID FUEL BARBEQUE GRILL
James R. Headberg, 10250 SW. 156th St., Miami, Fla. 33157
Filed May 7, 1973, Ser. No. 357,687
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—110



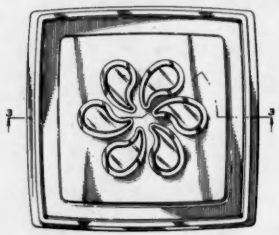
230,341
MICROWAVE OVEN AND CABINET COMBINATION
Gordon J. Waligorski, Lombard, Ill., assignor to Culitron Inc., Chicago, Ill.
Filed Oct. 13, 1972, Ser. No. 297,444
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—128



230,342
FOOD CONTAINER COVER
Paul C. Mallonn, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Feb. 24, 1972, Ser. No. 229,256
Term of patent 7 years
The portion of the term of the patent subsequent to Oct. 30, 1987, has been disclaimed
Int. Cl. D7—*02*
U.S. Cl. D7—131

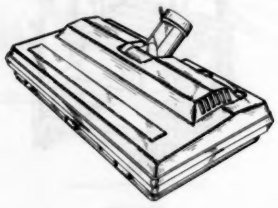


230,343
FOOD CONTAINER COVER
Paul C. Mallonn, Wooster, Ohio, assignor to Rubbermaid Sales Corp., Wooster, Ohio
Filed June 29, 1972, Ser. No. 267,632
Term of patent 7 years
The portion of the term of the patent subsequent to Mar. 5, 1981, has been disclaimed
Int. Cl. D7—*01*
U.S. Cl. D7—131

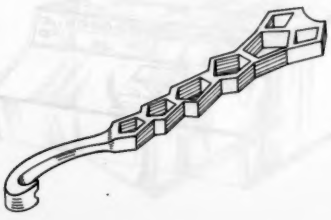


230,344
FOOD CONTAINER LID
William D. Taylor, Wooster, Ohio, assignor to Rubbermaid Incorporated
Filed Sept. 27, 1972, Ser. No. 294,264
Term of patent 7 years
Int. Cl. D7—*02*
U.S. Cl. D7—131

230,345
VACUUM CLEANER NOZZLE
Robert Brown, South Salem, N.Y., John Kowalewski, Riverside, Conn., Peter Medwed, Pound Ridge, N.Y., and John Moughty, Old Greenwich, Conn., assignors to Consolidated Foods Corporation, Old Greenwich, Conn.
Filed May 11, 1973, Ser. No. 359,234
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D7—173

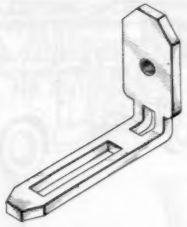


230,346
COMBINED MULTIPLE SOCKET WRENCH AND SPANNER
William James Stitt, Jr., 1320 Lynette Way, Sacramento, Calif. 95831
Filed Aug. 2, 1972, Ser. No. 277,350
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—26

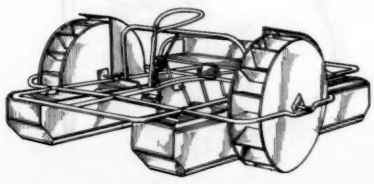


230,347
DOOR LATCH HANDLE
Claude Teggelaar, Grand Rapids, Mich., assignor to Wolverine Industries, Inc., Grand Rapids, Mich.
Filed Jan. 11, 1973, Ser. No. 322,855
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—170

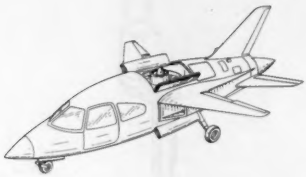
230,348
FITTING
Herman Sabel, 80 Chadwick Drive; Arnold Sabel, 19 Rebellion Road; and Leon W. Sabel, 3 Rebellion Road, all of Charleston, S.C. 29407
Filed July 26, 1972, Ser. No. 275,253
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—236



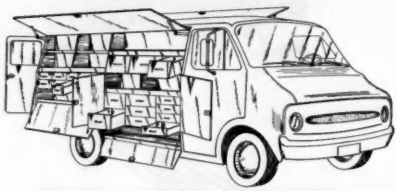
230,349
WATERCRAFT
Leonard A. Kyryluk, Vancouver, British Columbia, and Peter Spitz, Maple Ridge, British Columbia, Canada, assignors to Lightweight Industries Ltd., Port Coquitlam, British Columbia, Canada
Filed Mar. 22, 1972, Ser. No. 237,247
Claims priority, application Canada Sept. 27, 1971
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—68



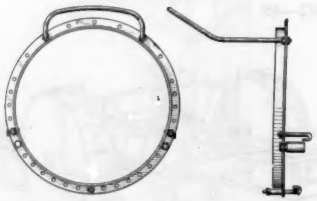
230,350
AIRCRAFT
Charles Bradbury, Hatfield, England, assignor to Hawker Siddeley Aviation Limited, Surrey, England
Filed Nov. 22, 1971, Ser. No. 201,256
Claims priority, application Great Britain May 21, 1971
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D2—75



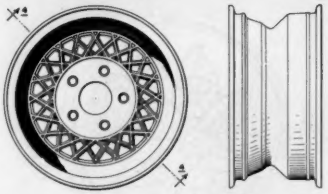
230,351
UTILITY VAN HAVING EXTERNALLY ACCESSIBLE COMPARTMENTS
Leo A. Hamel, 197 Auburn St., Cambridge, Mass. 02140
Filed May 8, 1972, Ser. No. 251,564
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—99



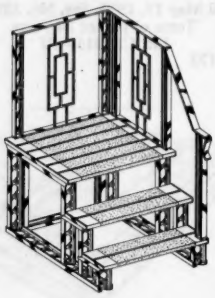
230,352
BICYCLE CARRIER FOR AUTOMOBILE
Walter Bernard, 4800 S. Lake Park Ave., Chicago, Ill. 60615
Filed Dec. 7, 1972, Ser. No. 313,160
Term of patent 14 years
Int. Cl. D12—*16*; D8—*99*
U.S. Cl. D12—158



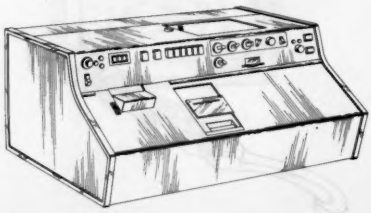
230,353
AUTOMOBILE WHEEL
Paul J. Mochel, Studio City, Calif., assignor to Appliance Plating Co., Inc.
Filed Sept. 10, 1971, Ser. No. 179,611
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—205



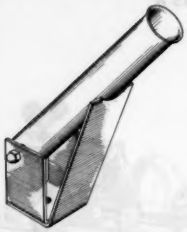
230,354
ENTRANCE STAIRCASE FOR MOBILE HOMES AND THE LIKE
Earl A. Roth, Akron, Ohio, assignor to Duncan Morris Co., Akron, Ohio
Filed Sept. 7, 1971, Ser. No. 178,536
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—7



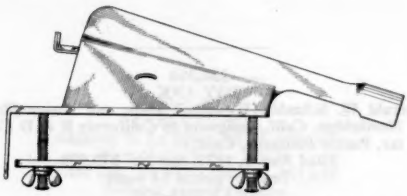
230,355
SCANNING DENSITOMETER
Jan A. van den Broek, Ann Arbor, George W. Toma, Dexter, and Lyle D. Frey, Whitmore Lake, Mich., assignors to Transidyne General Corporation, Ann Arbor, Mich.
Filed Oct. 12, 1972, Ser. No. 297,119
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D16—2 C



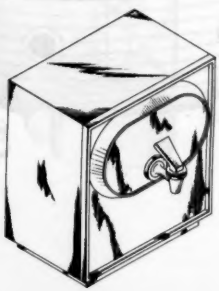
230,356
FISHING POLE HOLDER
Robert G. Nelson, 23206 U.S. 20, South Bend, Ind. 46628
Filed Dec. 6, 1972, Ser. No. 312,598
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—22



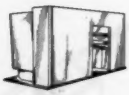
230,357
DETACHABLE HOLDER FOR A FISHING ROD AND REEL FOR MOUNTING ON A HORIZONTAL RAIL
Basil D. Ingram, 222 N. Belcher Road, Clearwater, Fla. 33515
Filed May 9, 1973, Ser. No. 358,660
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—22

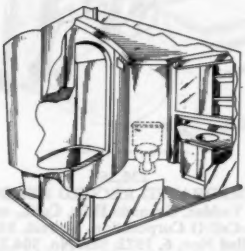


230,358
WATER FILTER
Samuel J. Mann, Englewood, N.J., assignor to Westinghouse Electric Corporation
Filed Sept. 15, 1971, Ser. No. 180,932
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4



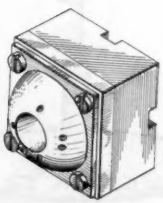
230,359
BATHROOM MODULE OR SIMILAR ARTICLE
Edgar H. Wood, 14 Alleyne St., Quincy, Mass. 02169
Filed Dec. 27, 1971, Ser. No. 212,842
Term of patent 14 years
Int. Cl. D23—*07*
U.S. Cl. D23—49



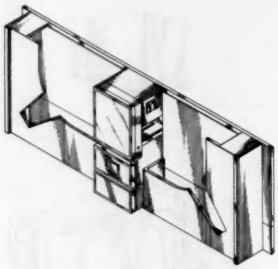


230,360
ORTHODONTIC BAND
Patrick B. Martin, Carlsbad, and Harry R. Smith, Montclair, Calif., assignors to Lancer Pacific, Incorporated, Pomona, Calif.
Filed Feb. 24, 1972, Ser. No. 229,259
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—1 C

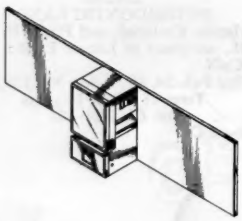
230,361
ADJUSTABLE INFRARED ENERGY SENSOR UNIT
Danilo V. Missio, 60 Rockmont Drive, Belmont, Mass. 02178
Filed Mar. 2, 1972, Ser. No. 231,442
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D26—1 F



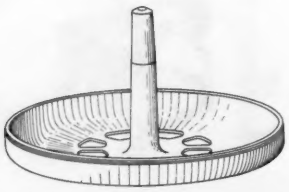
230,362
PERFORATED TAPE READER
Gene D. Vedder, Granada Hills, Calif., assignor to Ex-Cell-O Corporation, Detroit, Mich.
Filed Nov. 6, 1972, Ser. No. 304,231
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



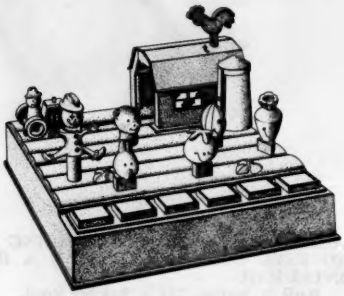
230,363
PERFORATED RECORD READER
Gene D. Vedder, Granada Hills, Calif., assignor to Ex-Cell-O Corporation, Detroit, Mich.
Filed Nov. 6, 1972, Ser. No. 304,236
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



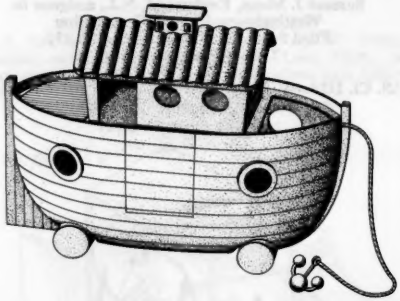
230,364
AERIAL SAUCER TOY
Bernard Friedman, P.O. Box 213, Allentown, Pa. 18105
Filed July 16, 1971, Ser. No. 163,552
Term of patent 14 years
The portion of the term of the patent subsequent to Mar. 16, 1985, has been disclaimed
Int. Cl. D21—*01*
U.S. Cl. D34—15 HH



230,365
FARM TOY
Lawrence T. Jones, Pacific Palisades, and Anson Sims, Redondo Beach, Calif., assignors to California R & D Center, Pacific Palisades, Calif.
Filed Mar. 2, 1972, Ser. No. 231,447
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 A

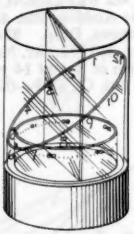


230,366
TOY ARK
Gerald W. Schmidt, Woodland Hills, and Anson Sims, Northridge, Calif., assignors to California R & D Center, Pacific Palisades, Calif.
Filed Aug. 9, 1972, Ser. No. 279,079
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 JJ

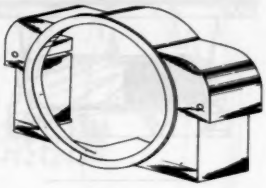


230,367
SUSPENDED FLOWER POT
Michael Neels, 3046 Marna Ave., Long Beach, Calif. 90808
Filed Sept. 13, 1971, Ser. No. 180,253
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 A

230,368
TABLE CLOCK
Anthony B. La Spina, 25 W. 45th St., New York, N.Y. 10036
Filed Dec. 23, 1971, Ser. No. 211,852
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D42—8 R

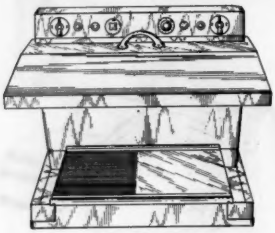


230,369
KILOWATT HOUR METER BASE COVER
Richard S. Jones, Bountiful, Utah, assignor to Sentinel Lighting & Manufacturing Company, Salt Lake City, Utah
Filed Jan. 14, 1972, Ser. No. 218,043
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—6 R

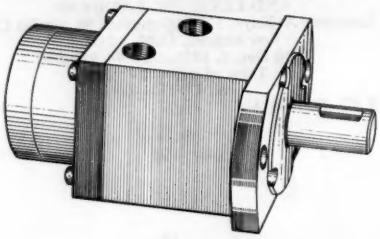


230,370
LADDER ATTACHMENT FOR EXTENDING AND LEVELING LADDERS
Lawrence A. Kaye, 12968 Greenleaf St., Studio City, Los Angeles, Calif. 91604
Filed Dec. 9, 1971, Ser. No. 209,590
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D54—1 A

230,371
GRILL
Oscar Philipe, Northwood, England, assignor to Anglo-Swiss (Equipment Production) Limited, London, England
Filed June 9, 1972, Ser. No. 261,563
Claims priority, application Great Britain Apr. 28, 1972
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D55—1 E



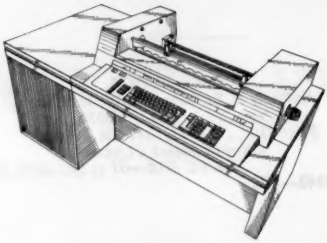
230,372
FLUID MOTOR
George V. Woodling, 22077 W. Lake Road, Rocky River, Ohio 44116
Continuation-in-part of abandoned design application Ser. No. 112,519, Feb. 3, 1971. This application June 30, 1972, Ser. No. 267,889
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D55—1 G



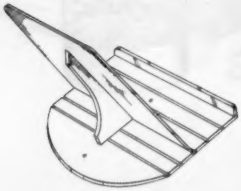
230,373
COMBINED LIGHT SENSOR AND CALCULATOR FOR A PHOTOFLASH UNIT
Peter T. Quinn, Littleton, and Charles E. Taylor, Denver, Colo., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Dec. 6, 1971, Ser. No. 205,464
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1 E

230,374
CAMERA FLASH MOUNTING BRACKET WITH LIGHT SENSOR
Peter T. Quinn and Dean M. Peterson, Littleton, Colo., assignors to Honeywell Inc., Minneapolis, Minn.
Filed June 12, 1972, Ser. No. 262,019
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1 E

230,375
ACCOUNTING MACHINE OR SIMILAR ARTICLE
Donald L. Forsythe and Jerome U. Brown, Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio
Filed Oct. 19, 1971, Ser. No. 190,697
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 B



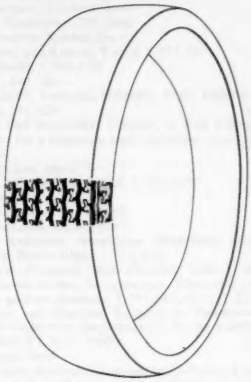
230,376
ADJUSTABLE TYPIST STAND FOR HOLDING REFERENCE DATA
Margerete Andrew, Rte. 4, Box 618, Eugene, Oreg. 97405
Filed Aug. 3, 1972, Ser. No. 277,618
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—1 C



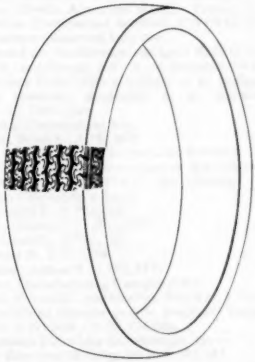
230,377
LABEL DISPENSER
David H. Netka, Encino, Calif., assignor to International Identification, Inc., Tarzana, Calif.
Filed Aug. 14, 1972, Ser. No. 280,429
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—1 B

230,378
SKI CARRYING CASE
Harvey Eisenberg, 7 Demarest Road, Livingston, N.J. 07039
Filed Feb. 17, 1972, Ser. No. 227,345
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R

230,379
PNEUMATIC TIRE TREAD AND BUTTRESS
James H. Bierbusse, Grosse Pointe Woods, and Clarence H. Vizina, Jr., Ferndale, Mich., assignors to Uniroyal, Inc., New York, N.Y.
Filed Apr. 19, 1972, Ser. No. 245,691
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20 R



230,380
PNEUMATIC TIRE TREAD AND BUTTRESS
Clarence H. Vizina, Jr., Ferndale, Mich., assignor to Uniroyal, Inc., New York, N.Y.
Filed June 14, 1972, Ser. No. 262,538
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20 R



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 12TH DAY OF FEBRUARY, 1974

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AAI Corporation: *See—*
La Costa, Nicholas J., 3,791,301.
Sweeney, Patrick E.; and Schneppe, Robert W., Jr., 3,791,303.

AB Asea-Atom: *See—*
Gustavsson, Eric Borje, 3,791,107.

AB Bahco Ventilation: *See—*
Gustavsson, Karl Axel G., 3,791,109.

AB Volvo: *See—*
Bane, Lars Olof, 3,791,233.

Abele, Werner, to Du Pont de Nemours, E. I., and Company. Silver halide photographic element containing a reaction product of a heterocyclic mercaptan and a chloro formic acid ester as antifog agent. 3,791,830, Cl. 96-76.00r.

Aberdeen Bag Company: *See—*
Brooks, Thomas W., 3,791,267.

Abolins, Visvaldis; Erhardt, Peter F.; and Holoch, Klaus E., to General Electric Company. Stabilized polyphenylene ether compositions. 3,792,121, Cl. 260-874.000.

Abolins, Visvaldis; and Reinhard, Donald L., to General Electric Company. Thermoplastic composition comprising a polyphenylene ether and a normally rigid resinous product of an acrylic monomer and diene rubber. 3,792,123, Cl. 260-876.00r.

ACF Industries, Incorporated: *See—*
Coyle, Edward L.; and Murph, Howard L., 3,791,168.

Achterrath, Ute: *See—*
Boguth, Walter; Studer, Rolf; Achterrath, Ute; and Kunze, Hans, 3,792,034.

Action Films, Inc.: *See—*
Komazaki, Tosio, 3,791,723.

Acushnet Company: *See—*
Schweiker, George C.; and Jepson, John W., 3,791,655.

Adams, John A., Jr.; Lee, Ernest O., Jr.; and Wichlajew, Karl, to Stromberg-Carlson Corporation. Dial up conference circuit. 3,792,202, Cl. 179-18.0bc.

Adams, Stanley B., to Caterpillar Tractor Company. Roll-over protection structure with deformable legs. 3,791,668, Cl. 280-150.00c.

Addor, Roger Williams; and Drabb, Thomas Walter, Jr., to American Cyanamid Company. Aralkylthiovinyl phosphorothioates used as insecticides and acaricides. 3,792,162, Cl. 424-216.000.

Adler, Karl; and Ducommun, Georges, to Biviator S.A., mesne. Timepiece having a nuclear power source. 3,791,134, Cl. 58-23.0ba.

Advance Transformer Co.: *See—*
Crawford, Joseph A., 3,792,310.

Aerochem Research Laboratories, Inc.: *See—*
Calmon, Calvin, 3,791,981.

Afanasiev, Vadim Nikolaevich; Gaiduchik, Vladimir Olegovich; and Gruzin, Pavel Lukich. Apparatus for determining the level and profile of a material. 3,792,252, Cl. 250-43.5ft.

Agence National de Valorisation de la Recherche (ANVAR): *See—*
Besson, Jean; Bonnat, Michel; Deportes, Grenoble Charles; and Kleitz, Michel, 3,791,937.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Anthony, Anne-Marie; Dembinski, Krzysztof; and Dupont, Lucien, 3,792,233.
Audoin, Claude, 3,792,368.

Agfa-Gevaert AG: *See—*
Fliesser, Engelbert, 3,791,566.

Agfa-Gevaert Aktiengesellschaft: *See—*
Balle, Gerhard; Himmelmann, Wolfgang; Ernst, Otto; and Nittel, Fritz, 3,791,857.
Blank, Rudolf; and Kluczynski, Achim, 3,791,605.
Kohlmannsperger, Josef, 3,791,843.
Von Bonin, Wulf; Geiger, Julius; Meinhardt, Gunter; Meyer, Karl-Otto; Wagenknecht, Werner; and Himmelmann, Wolfgang, 3,791,831.
Wick, Richard; Pfeifer, Josef; and Hofmann, Wilfried, 3,792,483.

Agfa-Gevaert N.V.: *See—*
Verhille, Karel Eugeen; and Voet, Luciaan Frans, 3,791,825.

Ahlberg, Carl S.; and Drongeson, John W., to Minnesota Mining and Manufacturing Company. Lenses. 3,791,722, Cl. 351-45.000.

Ahlstrom, Lamarche, & Co., Inc.: *See—*
Beltz, John P.; and Ahlstrom, Timothy P., 3,792,447.

Ahlstrom, Timothy P.: *See—*
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Aidlin Automation, Inc.: *See—*
Aidlin, Samuel S.; Aidlin, Stephen H.; and Rich, David, 3,791,553.

Aidlin, Samuel S.; Aidlin, Stephen H.; and Rich, David, to Aidlin Automation, Inc. Hopper-type apparatus for orienting and feeding tubular containers or like articles. 3,791,553, Cl. 221-156.000.

Aidlin, Stephen H.: *See—*
Aidlin, Samuel S.; Aidlin, Stephen H.; and Rich, David, 3,791,553.

Air Logistics Corporation: *See—*
Schirtzinger, Joseph F., 3,791,328.

Air Products and Chemicals, Inc.: *See—*
Uffner, Melville W.; and Holland, Dewey G., 3,792,128.

Aisen Seiki Kabushiki Kaisha: *See—*
Nakane, Mototaka, 3,791,502.

Aisin Seiki Company, Limited: *See—*
Hirozawa, Koichiro, 3,791,686.

Aisin Seiki Kabushiki Kaisha: *See—*
Kitano, Shin; and Kagata, Tooru, 3,791,237.
Wada, Takeshi, 3,792,433.

Ajinomoto Co., Inc.: *See—*
Ogata, Koichi; Yamada, Hideake: Enei, Hitoshi; and Okumura, Shinji, 3,791,924.

Akashi, Goro; and Hirakawa, Takashi, to Fuji Photo Film Co., Ltd. Friction sheet for a magnetic tape recording cassette. 3,791,608, Cl. 242-199.000.

Aktiebolaget Bofors: *See—*
Simmons, Bjorn Herman Olof, 3,791,299.

Aktiebolaget Iro: *See—*
Gunnar, Kurt Arne, 3,791,599.

Akzona Incorporated, mesne: *See—*
Schuurs, Antonius Hermanus Wilhelmus Maria; and Van Weemen, Bauke Klaas, 3,791,932.

Albano, Robert Edmund; and Dyment, John Cameron, to Bell Telephone Laboratories, Incorporated. Chemical growth of insulating layers on gallium arsenide. 3,791,862, Cl. 117-213.000.

Albertin, Andre; and Chartier, Bernard, to Thomson-CSF. Cathode-ray tube with deflection amplification and post-deflection acceleration. 3,792,303, Cl. 315-17.000.

Albrecht, Konrad: *See—*
French, Heinz; Albrecht, Konrad; and Schafer, Eugen, 3,791,811.

Albright, William H. Self-tensioning printing plate saddle. 3,791,295, Cl. 101-415.100.

Albrizzi, Alexander Rubin de Cervin, to Albri zi Ltd. Components for constructional purposes. 3,791,091, Cl. 52-593.000.

Albrizzi Ltd.: *See—*
Albrizzi, Alexander Rubin de Cervin, 3,791,091.

Alburger, James R. Testing panel for inspection penetrants having cracks of controlled depth and width. 3,791,198, Cl. 73-53.000.

Alcock, Richard A.; and Shosie, Wayne A., to Fastener Engineers, Inc. Motor-driven hydrostatic transmission. 3,791,148, Cl. 60-456.000.

Alderman, Robert Joe. Suspended ceiling. 3,791,089, Cl. 52-484.000.

Alexander, Andrew, to Aluminum Company of America. Process for sealing anodized aluminum. 3,791,940, Cl. 204-35.00n.

Alexander, Milton: *See—*
Garrett, John W.; Alexander, Milton; and Riepenhoff, Ralph R., 3,791,610.

Alfa Romeo S.p.A.: *See—*
Garcea, Gian Paolo, 3,792,343.

Algoma Steel Corporation, Limited, The: *See—*
Lucenti, Gary S., 3,791,015.

Aliwka, Artur: *See—*
Vollhardt, Frohmut; John, Harald; Rittinger, Wilhelm; Saum, Walter; Aliwka, Artur; and Wodtke, Friedrich, 3,791,441.

Allard, Francois. Construction member. 3,791,912, Cl. 161-160.000.

Allegheny Ludlum Industries, Inc.: *See—*
Ramachandran, Sundaresan; and Igwe, Basil U. N., 3,791,813.

Allen, John K.; and Cengel, John A., to Standard Oil Company. Catalysis of urethane foams with a mixture of an antimony trihalide and either an antimony alcoholate or an antimony carboxylate. 3,792,001, Cl. 260-2.5ab.

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Almasi, George S.; Keefe, George E.; and Lin, Yeong S., to International Business Machines Corporation. Non-destructive sensing of very small magnetic domains. 3,792,451, Cl. 340-174.0eb.
Altenburger, Otto; and Bansemir, Robert H., to Stromberg-Carlson Corporation. Matrix switching network control link interconnection circuit. 3,792,200, Cl. 179-18.0ge.
Altman, Daniel E.; Barstow, Glidden J.; and Geller, Myer, to United States of America, Navy. Metallic vapor laser assembly. 3,792,373, Cl. 331-94.500.
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Arick, Robert E.; and Vogel, Ralph A., to Essex International, Inc. Apparatus and method for forming wave winding for dynamoelectric machine. 3,791,419, Cl. 140-92.100.
Ariga, Keiji; Morishita, Satoshi; Kanda, Katsumi; and Mizobe, Takashi, to Toyo Kohan Co., Ltd. Electroplated steel sheet. 3,791,801, Cl. 29-196.500.
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Bazelmans, Wilhelmus Joannes Cornelius Maria; and Bazelmans, Jozef Alfons Maria. Apparatus for ironing articles of laundry. 3,791,055, Cl. 38-11.000.

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Sundahl, Robert Charles, Jr., 3,791,861.

Beloit Corporation: *See*—
Busker, Leroy H.; and Daane, Robert A., 3,791,044.

Beltz, John P.; and Ahlstrom, Timothy P., to Ahlstrom, Lamarche, & Co., Inc. Display device control system. 3,792,447, Cl. 340-172.500.

Benckiser, Joh. A., GmbH, Chemische Fabrik: *See*—
Krueger, Friedrich; and Bauer, Lieselotte, 3,791,978.

Benda, David; and Kerstetter, Donald R., to GTE Sylvania Incorporated. Cathode ray tube having a conductive metallic coating therein. 3,792,300, Cl. 313-85.00r.

Bendersky, David; and Poister, Clarence E., to PK Products, Inc. Toilet stool ventilating means. 3,790,970, Cl. 4-217.000.

Bendix Corporation, The: *See*—
Blanchard, William C., 3,791,216.
Bostley, Robert J., 3,791,660.
Braunlich, Peter F., 3,792,282.
Graham, James T.; and Hackstock, Fred W., 3,791,010.
Payne, Delmar V.; and Jaeckle, Wilfried G., 3,792,472.
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Benner-Nawman, Inc.: *See*—
Nawman, Rollie B., 3,791,677.

Bennett, John T. Tool holder with provisions for accurately positioning cutting inserts and an improved chip breaking indexible insert. 3,791,001, Cl. 29-95.00r.

Bennett, Walter Scott; and Vigil, Jacob Frank, to Burroughs Corporation. Failsoft peripheral exchange. 3,792,448, Cl. 340-172.500.

Benson, Robert W.; Chapman, James Ronald; Reed, Robert G.; and Smith, Hoyt L., to Cutters Machine Company, Inc. Electrically controlled cloth spreading machine. 3,791,641, Cl. 270-31.000.

Bentley, Robert F.: *See*—
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Berends, Howard P., to Holland Hitch Company. Kingpin assembly. 3,791,674, Cl. 280-433.000.

Berger, Karl W., to Westinghouse Electric Corporation. Thyristor control for a plurality of motors. 3,792,325, Cl. 318-79.000.

Bergmann, Paul F.; and Coates, David L., to Johnson Products, Inc. Mechanical lash adjuster for overhead cam engines. 3,791,355, Cl. 123-92.270.

Bergmeyer, Hans Ulrich: *See*—
Thum, Waldemar; Wahlefeind, August Wilhelm; Naher, Gotthilf; Gruber, Wolfgang; Mollering, Hans; Weimann, Gunter; and Bergmeyer, Hans Ulrich, 3,791,931.

Bergstedt, Lowell C., to Searle, G. D., & Co. Scintillation camera with improved resolution. 3,792,273, Cl. 250-366.000.

Berleyoung, Walter J.: *See*—
Brakebill, Harold G.; Lewis, Jay L.; and Berleyoung, Walter J., 3,791,405.

Bermes, Rudolf; and Schmeidl, Karl, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. 2,2-Dimethylpropanediol-1,3-dinitrite. 3,792,077, Cl. 260-467.000.

Bernardi, Luigi; De Castiglione, Roberto; Fregnan, Gian Carlo; and Goffredo, Onofrio, to Societa Farmaceutical Italia. Polypeptides related to the C-terminal heptapeptide of bombesin and alytesin. 3,792,032, Cl. 260-112.500.

Bernhart, Donald Norman, to Stauffer Chemical Company. Process for preparing alkyl phenyl phosphate and phosphorothionate compounds. 3,792,132, Cl. 260-973.000.

Berretta, Philip L. Lap board for flight personnel. 3,791,314, Cl. 108-43.000.

Bertagni, Jose Juan. Voice coil. 3,792,394, Cl. 335-299.000.

Bertner, Clau: *See*—
Henn, Ruthild; Deiters, Dink; Schultze, Hans-Joachim; and Bertner, Clau, 3,792,045.

Besson, Jean; Bonnat, Michel; Deportes, Grenoble Charles; and Kleitz, Michel, to Agence National de Valorisation de la Recherche (ANVAR). Method and device for regulating the content in a gaseous mixture of a given pure gas, especially oxygen. 3,791,937, C. 204-1.00r.

Best, Fulton J. Vibrator roller. 3,791,629, Cl. 259-1.00r.

Bethlehem Steel Corporation: *See*—
Aubrey, William M., Jr., 3,791,595.
Cody, Thomas E.; Davison, Arthur L.; Grohowski, Joseph A.; Horvath, Geza J.; and Linde, Theodore R., 3,791,743.
List, Harold A.; and Baker, Jack H., 3,791,204.

Bhan, Andrew Tej, to Universal Oil Products Company. Recuperative thermal recombining system for handling loss of reactor coolant. 3,791,923, Cl. 176-37.000.

Biber, Conrad H.; and Shenk, Edwin K., to Polaroid Corporation. Photographic apparatus with solenoid powered instrumentalities. 3,791,278, Cl. 95-53.0ea.

Bick, Maurice; and Lochet, Jean A., to Auric Corporation. Gold plating bath for barrel plating operations. 3,791,941, Cl. 204-46.000.

Bierwith, Stanton F., to Great Canadian Oil Sands, Limited. Dip construction for bucket wheel excavators. 3,791,054, Cl. 37-141.00r.

Bigliardi, Achille M., III: *See*—
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Bilski, Richard E., to General Electric Company. Dynamic lip seal. 3,791,657, Cl. 277-153.000.

Bio/Physics Systems, Inc.: *See*—
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Birch, Allan James: *See*—
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Bjerke, Brian Kenneth; and Siverling, Michael McHugh, to International Business Machines Corporation. Document scanner having optical diffusion means. 3,792,268, Cl. 250-219.00q.

Black, Samuel J.: *See*—
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Blackburn, Wayne A.; and Hemness, Sevall W. Fluid metering apparatus. 3,791,212, Cl. 73-251.000.
Blada-Werke: *See—*
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Blanchard, William C., to Bendix Corporation, The. Piezoelectric driven unloaded pressure sensor. 3,791,216, Cl. 73-398.00r.
Blank, Rudolf; and Kluczynski, Achim, to Agfa-Gevaert Aktiengesellschaft. Rotary spool for storage of convoluted photographic film or the like. 3,791,605, Cl. 242-74.000.
Blase, Helmut: *See—*
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Coombes, William A.; Zavada, Richard A.; Hansen, John E.; Singleton, William A.; and King, Robert R., 3,792,067.
Blickman, Bernard I. Environmental-isolation room door-seal. 3,791,075, Cl. 49-484.000.
Bliss, Arthur E.; and Marshall, Edward W., to Varian Associates. Electrostatic recorder employing three voltage level switching between the stylus electrodes and the backplate sections. 3,792,495, Cl. 346-74.0es.
Blumenthal, Stanley P.; Krasnick, Solomon; and Gillespie, Gerald W., to Tel-A-Dex Corporation. Instore information dispensing system. 3,792,437, Cl. 340-152.00r.
Bluttell, Victor Frederick, to Linolite Limited. Tubular lamp fittings. 3,792,247, Cl. 240-51.11r.
Bobbitt, Charles R., to Honeywell Information Systems, Inc. Dual channel, dual potential open-circuit test apparatus. 3,792,349, Cl. 324-51.000.
Bochnak, Gregory; and MacLennan, Roderick A., to United Aircraft Corporation. Hydraulic fluid supply apparatus for a hydraulic servomechanism. 3,791,775, Cl. 417-426.000.
Bodinger, Donald C.: *See—*
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Boehringer Mannheim Gesellschaft mit beschrankter Haftung: *See—*
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Boeing Company, The: *See—*
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Moorehead, James R., 3,791,586.
Bogar, Joseph E.; Bragg, John K.; and Hare, Goerge H., to Singer Company, The. System for overcoming faults in magnetic anisotropic material. 3,792,450, Cl. 340-174.0ed.
Bogel, Graham D.: *See—*
Wilson, Kenneth A.; and Bogel, Graham D., 3,792,195.
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Boguth, Walter; Studer, Rolf; Achterrath, Ute; and Kunze, Hans, to Hoffmann-La Roche Inc. Tripeptide and acid addition salts. 3,792,034, Cl. 260-112.500.
Boise Cascade Corporation: *See—*
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Bokovoy, Ronald D., to Boise Cascade Corporation. Differential mechanism of the holdout ring type. 3,791,238, Cl. 74-750.000.
Bole, Hamilton B., to American Optical Corporation. Lens frangibility testing apparatus. 3,791,193, Cl. 73-12.000.
Boleky, Edward Joseph, III, to RCA Corporation. Fabrication of monolithic integrated circuits. 3,791,024, Cl. 29-577.000.
Bolton, Joseph A., III, to Bird Machine Company. Process for producing kraft paper laminate of top stock and base stock layers. 3,791,917, Cl. 162-55.000.
Bolza-Schunemann, Hans-Bernhard, to Schnellpressenfabrik Koenig & Bauer Aktiengesellschaft. Sheet feeder for printing presses. 3,791,642, Cl. 271-51.000.
Bolze, Manfred: *See—*
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Bombardier, Alphonse R.; Bombardier, Gerard; and Bombardier, Germain, said Bombardier, Alphonse, and Bombardier, Gerard, assors. to said Bombardier, Germain. Hull construction for watercraft. 3,790,977, Cl. 9-6.000.
Bombardier, Gerard: *See—*
Bombardier, Alphonse R.; Bombardier, Gerard; and Bombardier, Germain, 3,790,977.
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Bondini, Arnaldo; and Murari, Bruno, to Societa Generale Semiconduttori S.p.A. Protection device for a power element of an integrated circuit. 3,792,316, Cl. 317-31.000.
Bonnat, Michel: *See—*
Besson, Jean; Bonnat, Michel; Deportes, Grenoble Charles; and Kleitz, Michel, 3,791,937.
Boone, Roger S.; and Pyott, Frank. Contact lens holder. 3,791,689, Cl. 294-1.0ca.
Boragine, Carolo: *See—*
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Borchert, Earl E., to Ferro Corporation. Bacterial spoilage inhibited metal working lubricant compositions. 3,791,974, Cl. 252-49.500.
Borden, Inc.: *See—*
Hollingsworth, Clinton Allen; and Lamb, Louis John, 3,791,810.
Borel, Joseph; Deutsch, Jean-Claude; Labrunie, Guy; and Robert, Jacques, to Commissariat a l'Energie Atomique. Device for deflecting a light beam. 3,791,716, Cl. 350-160.01c.
Borg-Warner Corporation: *See—*
Donovan, Daniel L., 3,791,632.
Bosch, Robert, G.m.b.H.: *See—*
Eckert, Konrad; and Knapp, Heinrich, 3,791,359.
Hofmann, Eberhard, 3,791,171.
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Schmaldienst, Peter; and Gemander, Georg, 3,791,363.
Schmidt, Gunther, 3,791,019.
Bossler, Fred Christian; and Kent, William Harold, Jr., to Bell Telephone Laboratories, Incorporated. Detection of metal shield faults in buried cable. 3,792,350, Cl. 324-52.000.
Bostick, Frank W.: *See—*
Landis, Earle H.; and Bostick, Frank W., 3,791,045.
Bostley, Robert J., to Bendix Corporation, The. Device for gripping, driving and supplying coolant to a cutting tool having coolant passages therein. 3,791,660, Cl. 279-20.000.
Botros, Raouf, to American Aniline Products, Inc. Aromatic polyester textile fibers dyed with bis(arylamino) dihydroxyanthraquinone dyes. 3,791,785, Cl. 8-39.000.
Boudinot, Ralph A. Windbreakers for railway locomotives. 3,791,313, Cl. 105-456.000.
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Bowling, J. Dennis, to Hearin Forest Industries. Ridge roof beam. 3,791,082, Cl. 52-79.000.
Bowring, David John, to GKN Sankey Limited. Washing and filling machines. 3,791,425, Cl. 141-92.000.
Bowser, George H., to PPG Industries, Inc. Multiple glazed unit. 3,791,910, Cl. 161-45.000.
Boyd, Donald R., to Allis-Chalmers Corporation. Magnetic actuator device. 3,792,390, Cl. 335-229.000.
Boyer, Lynn Forrest; and Johnson, Anderson Forbes, Jr., to Western Electric Company, Incorporated. Selective coating. 3,791,342, Cl. 118-52.000.
Boyle, Willard Sterling; and Smith, George Elwood. Buried channel charge coupled devices. 3,792,322, Cl. 317-235.00r.
Boyum, Ronald D.: *See—*
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Brackenridge, David R.: *See—*
Kolodchin, William; and Brackenridge, David R., 3,792,117.
Brackett, Charles Arthur, to Bell Telephone Laboratories, Incorporated. Suppression of spurious bias circuit oscillations in impatt oscillators. 3,792,375, Cl. 331-96.000.
Bradley, William J. Adjustable pivotal headboard. 3,790,973, Cl. 5-53.00b.
Brady, Donnie G.: *See—*
Cardenas, Carlos G.; and Brady, Donnie G., 3,792,116.
Bragg, John K.: *See—*
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Brakebill, Harold G.; Lewis, Jay L.; and Berleyoung, Walter J., to Robertshaw Controls Company. Pressure regulator construction and method of making the same. 3,791,405, Cl. 137-494.000.
Brand, Warren H.; and Scott, John, Jr., to Yarway Corporation. Pilot-operated steam traps. 3,791,578, Cl. 236-54.000.
Brandeberry, Don R.: *See—*
Fritch, Junior L.; and Brandeberry, Don R., 3,791,780.
Brandenburg, John T.; Suggitt, Robert M.; and Liden, Thomas M., to Texaco Inc. Conversion of alkylaromatics. 3,792,098, Cl. 260-668.00a.
Brannen, William T.; and Watson, Roger W., to Standard Oil Company (Indiana). Fuel and lubricating oil additives-transition metal complexes. 3,791,804, Cl. 44-68.000.
Brannen, William T.; and Watson, Roger W., to Standard Oil Company (Indiana). Transition metal complexes as fuel and motor oil additives. 3,791,805, Cl. 44-68.000.
Branscum, Tony E., to Gott Manufacturing Co., Inc. Ice chest construction. 3,791,547, Cl. 220-17.000.
Branscum, Tony E.; Morgan, Bill T.; and Peters, Donald L., to Phillips Petroleum Company. Method for blow molding a hollow article having an attached hollow adjunct. 3,792,143, Cl. 264-94.000.
Branson Incorporated: *See—*
Mims, Bruce L., 3,791,569.
Braunlich, Peter F., to Bendix Corporation, The. Stimulated exoelectron emission dosimeter having high spatial resolution. 3,792,282, Cl. 250-459.000.

Breckbill, Frank D. Snow compacting apparatus. 3,791,053, Cl. 37-10.000.

Brehme, Hans, to Zeise, Theodor. Ship's propeller. 3,791,762, Cl. 416-198.000.

Breikss, Ivars P., to Honeywell Inc. Recording and playback system for self-clocking digital signals. 3,792,443, Cl. 340-172.500.

Breitfuss, Thomas K., to Hydro Conduit Corporation. Transport vehicle having lift mechanism and associated extendible and retractable mobile object support. 3,791,540, Cl. 214-75.00r.

Brendgord, Thomas, to American Sterilizer Company. Enclosure structure for modular system. 3,791,528, Cl. 211-88.000.

Brenholdt, Irving R., to Farrand Optical Co., Inc. Size gauging and quality inspecting rotating articles by imaging onto spatial filters and detectors. 3,791,741, Cl. 356-163.000.

Brewer, George R.; and Law, Russell R., to Hughes Aircraft Company. Process for accurately marking precise rectangular areas. 3,791,270, Cl. 95-1.000.

Brewer, Howell K., to United States of America, Air Force. Filament-wound, toroidal tire with pneumatic rim-locking tube. 3,791,433, Cl. 152-339.000.

Bridel, Laiteries E.: *See—*
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Bridge, Alan G.: *See—*
Mitchell, David S.; Bridge, Alan G.; and Jaffe, Joseph, 3,791,989.

Bright, William L. Safety lock for enclosures. 3,791,683, Cl. 292-32.000.

Brinkmann, Jurgen; Rasche, Manfred; and Heissmann, Willi, to Varta Aktiengesellschaft. Storage battery electrode. 3,791,869, Cl. 136-81.000.

Brinkmann, Ludwig: *See—*
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Bristol Myers Company: *See—*
Kawaguchi, Hiroshi; Konishi, Masataka; and Tsukiura, Hiroshi, 3,792,037.

Bristol, Thomas W., to Hughes Aircraft Corporation. Surface-wave electro-acoustic transducer. 3,792,381, Cl. 333-72.000.

British Petroleum Company, Limited, The: *See—*
Davies, Owen Mansel; Olive, Martin Frederick; Cook, Terence John; and Hilder, Graham Keith, 3,791,960.

Broadhead, John; and Butherus, Alexander Duane, to Bell Telephone Laboratories, Incorporated. Rechargeable nonaqueous battery. 3,791,867, Cl. 136-6.00r.

Brocker, John Race, to Motorola, Inc. Tone detector with constant detection response time. 3,792,290, Cl. 307-233.000.

Broden, Kenneth John. Tissue roll dispenser. 3,791,601, Cl. 242-55.530.

Broggi, Allen J.: *See—*
Ulrich, Henri; Stuber, Fred A.; and Broggi, Allen J., 3,792,025.

Brogli, Hans; and Brogli, Werner F. Method and apparatus for the manufacture of an emulsion. 3,791,984, Cl. 252-308.000.

Brogli, Werner F.: *See—*
Brogli, Hans; and Brogli, Werner F., 3,791,984.

Brooks, Thomas W., to Aberdeen Bag Company. Method and apparatus for making packages of interconnected plastic bags and the like. 3,791,267, Cl. 93-35.00r.

Brothers, Jack; and Puzia, Walter J. Strapping severing tool. 3,791,031, Cl. 30-124.000.

Brown, Barry M.; and Ray, Elbert L., to Eastman Kodak Company. Process for manufacturing cellulosic reverse osmosis membranes using a very high temperature initial aqueous quench. 3,792,135, Cl. 264-41.000.

Brown, Bertram Keith: *See—*
Pierson, John Oliver; White, Roger Douglas; and Brown, Bertram Keith, 3,791,323.

Brown, Melancthon S.; and Hohn, Gustave K., to Chevron Research Company. N-substituted aryl carbamates as insecticides. 3,792,169, Cl. 424-300.000.

Brown Oil Tools, Inc.: *See—*
Cochran, Chudleigh B., 3,791,449.

Brown, Patrick Michael; and May, Vernon Bruce, to Grace, W. R., & Co. Low density molding powder of vermiculite and clay. 3,791,836, Cl. 106-71.000.

Brown, Wallace W. Collapsible cable spool. 3,791,606, Cl. 242-115.000.

Broyden, Robert H.: *See—*
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Bruggink, Gordon J., Sr. Drying apparatus for barn milk lines. 3,791,046, Cl. 34-104.000.

Brun, Jens; and Nielsen, Hans, to Vald. Henriksen A/S. Apparatus for dyeing yarns in bobbins. 3,791,179, Cl. 68-198.000.

Bruning, Paul F., to Electronic Machining Company. Lift structure. 3,791,329, Cl. 114-66.50r.

Bruns, Carl Newton, to Stauffer Chemical Company. Paste type organopolysiloxane composition and fabrics coated therewith. 3,791,998, Cl. 260-2.50s.

Bruns, Eugene G.: *See—*
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Bryan, Horace V. A. Vehicle exit signaling system. 3,792,468, Cl. 340-326.000.

Bryan, John F., Jr. Dynamic load increasing automobile bumper. 3,791,468, Cl. 180-1.0fv.

Bryngdahl, Olof, to Xerox Corporation. Multiple image formation through self-imaging. 3,791,275, Cl. 95-18.00r.

Bucalo, Brian D. Method and apparatus for manufacturing toilet paper rolls. 3,791,266, Cl. 93-1.00r.

Buchman, John M. Apparatus for simplifying the playing of a song bell type instrument. 3,791,250, Cl. 84-483.000.

Buckman, Raymond W., Jr., to Westinghouse Electric Corporation. Tantalum base alloys. 3,791,821, Cl. 75-174.000.

Bucks, Robert M.; and Ayars, Frederick M., to Mark & Son, Ltd. Vehicle data recording system. 3,792,445, Cl. 340-172.500.

Bucode, Inc.: *See—*
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Buell, Bennett George, to American Cyanamid Company. Brightening plastics with 2-aryl-5-cyanonaphthoxazole brighteners. 3,792,056, Cl. 260-307.000.

Buffalo Brake Beam Company: *See—*
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Bugaut, Andree: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 3,792,090.

Bullock, Greg A., to Du Pont de Nemours, E. I., and Company. Nitro ethyl sulfones. 3,792,093, Cl. 260-607.00a.

Bullock, John, to Arrow-Hart, Inc. Circuit breaker. 3,792,403, Cl. 337-66.000.

Bunker Ramo Corporation: *See—*
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Bunker-Ramo Corporation: *See—*
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Bunshah, Rointan F., to University of California, The Regents of the. High rate deposition of carbides by activated reactive evaporation. 3,791,852, Cl. 117-93.200.

Burckhardt, Manfred H.; Krohn, Hellmut; Grossner, Horst; and Florus, Hans-Jorg, to Daimler-Benz Aktiengesellschaft. Brake-force control system for vehicles, especially motor vehicles. 3,791,702, Cl. 303-21.0be.

Burdick, Robert E.: *See—*
Baker, Terry M.; Kieding, Robert B.; Huthsing, Henry W.; and Burdick, Robert E., 3,791,535.

Burdick, Robert E., to Rolair Systems, Inc. Control unit for air cushion systems. 3,791,477, Cl. 180-117.000.

Burger, Edward. Debris pickup and collection apparatus. 3,790,986, Cl. 15-328.000.

Burgess, George A.: *See—*
Reckseit, Bernard S.; and Burgess, George A., 3,791,539.

Burhans, Richard Orman: *See—*
Carini, George F.; Williams, George H.; and Burhans, Richard Orman, 3,791,835.

Burkett, Francis L.; and Lee, Richard J., to Dow Chemical Company, The. Packaging process. 3,792,144, Cl. 264-96.000.

Burkin, Yury Alexandrovich: *See—*
Seleznev, Yury Emelyanovich; and Burkin, Yury Alexandrovich, 3,791,007.

Burmistrova, Tamara Petrovna; Bardina, Tatyana Alexandrovna; Galpern, Grigary Davidovich; Karaulova, Elena Nikolaevna; Luchai, Nonna Alexandrovna; Terpilovsky, Nikolai Nikolaevich; and Khitrik, Adolf Alexandrovich. Process for producing sulphoxides. 3,792,95, Cl. 260-607.00a.

Burns, Gerald Edward: *See—*
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Burns Investment Corporation: *See—*
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Burns, Jerome Q.; and Green, William C., to Ocean Science and Engineering, Inc. Motion compensated crown block system. 3,791,628, Cl. 254-172.000.

Burrell, Lower: *See—*
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Burroughs Corporation: *See—*
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Wymore, Charles E.; and LeCain, Paul R., 3,792,441.

Burroughs Wellcome Co.: *See—*
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Burt, Glenn R.; Condo, Albert C.; Odsather, Richard L.; and Eliason, Kay E., to Atlantic Richfield Company. Foundation for construction on frozen substrata. 3,791,443, Cl. 165-45.000.

Buser, Warren H. Slotted canopy arrangement for volkswagen engine compartments. 3,791,471, Cl. 180-54.00a.

Bush, Clarence C., to United States of America, Army. Eye protector for welders. 3,792,226, Cl. 219-147.000.

Bush, John E.; and Morgan, Leland M., to United States of America, Navy. Ramjet engine fuel controller. 3,791,141, Cl. 60-243.000.

Bush, Walter Monroe; Gates, John Warburton, Jr.; and Newmiller, Robert John, to Eastman Kodak Company. Onium indophenoxides. 3,791,827, Cl. 96-22.000.

Busker, Leroy H.; and Daane, Robert A., to Beloit Corporation. Through drying for fibrous web. 3,791,044, Cl. 34-9.000.

Butherus, Alexander Duane: *See—*
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Butler, John R.: *See—*
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Butler, John V., to Lockheed Aircraft Corporation. Particle standard and calibration method. 3,791,192, Cl. 73-1.00r.

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Buzzi, Gunter, to Grohe, Hans, KG. Head shower. 3,791,588, Cl. 239-446.000.

Cadiou, Jean Georges, to Societe Anonyme Automobiles Citroen. Power steering apparatus. 3,791,475, Cl. 180-79.20r.

Cadwell, Edward Peter, to Treadwell Corporation. Recovery of copper from copper sulfide containing concentrates. 3,791,817, Cl. 75-106.000.

Cairns, Hugh; and Hunter, Dennis, to Fisons Limited. Bis chromone-2-carboxylic acids. 3,792,063, Cl. 260-345.200.

Caldarelli, Antonio. Fluid-powered engine. 3,791,142, Cl. 60-263.000.

California Computer Products, Inc.: *See—*
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California Institute of Technology: *See—*
Haley, Floyd C., 3,791,106.

Callullerovich, Maximo. Wheel and tire therefor. 3,791,432, Cl. 152-339.000.

Calmon, Calvin, to Aerochem Research Laboratories, Inc. Volume reduction of radioactive ion exchange resins for disposal. 3,791,981, Cl. 252-301.10w.

Calpis Food Industry Co., Ltd., The: *See—*
Inagami, Kaoru; and Kamada, Hidemoto, 3,792,184.

Cambridge Thermionic Corporation: *See—*
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Cameron, Herbert A. Dowel. 3,791,750, Cl. 403-297.000.

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Canon Kabushiki Kaisha: *See—*
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Canup, Robert E.; and McPeak, Earl W., Jr., to Texaco Inc. Adaptable photoelectric automotive distributor combination. 3,792,261, Cl. 250-233.000.

Cappelle, Norman D.; and Tap, Henry H., to Oak Industries, Inc. Slip Clutch for television fine tuning mechanism. 3,791,226, Cl. 74-10.800.

Cardenas, Carlos G.; and Brady, Donnie G., to Phillips Petroleum Company. Flame-resistant polymeric compositions containing brominated adducts of acyclic trienes. 3,792,116, Cl. 260-861.000.

Carini, George F.; Williams, George H.; and Burhans, Richard Orman, to Dresser Industries, Inc. Semi-silica plastic refractory composition. 3,791,835, Cl. 106-68.000.

Carlow, Earl F., to Motorola, Inc. Multi-frequency signal generator. 3,792,360, Cl. 328-14.000.

Carlson, David John, to RCA Corporation. High frequency automatic gain control circuits. 3,792,359, Cl. 325-319.000.

Carmellini, Andrew E.; and Rogers, Andrew J., to Commercial Decal, Inc. Low temperature decalcomania. 3,791,841, Cl. 117-3.400.

Carpigiani, Poerio. Machine and method for making a soft ice product formed of frozen air-and-gelatin dispersion. 3,792,182, Cl. 426-250.000.

Carreira, Leonard M., to Xerox Corporation. Photoelectrophoretic imaging transfer method. 3,791,823, Cl. 96-1.400.

Carrier Corporation: *See—*
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Honnold, Fred V., Jr.; and Johnson, Richard L., 3,791,165.
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Carver, Charles M. Hole punching tool. 3,791,034, Cl. 30-367.000.

Case, Edward M.: *See—*
Zumeta, Julio; and Case, Edward M., 3,791,658.

Case, Everett N., to Atlantic Richfield Company. Process for producing phosphoric acid. 3,792,151, Cl. 423-166.000.

Casey, Richard C.; Duggan, Robert J.; Grosky, Stephen A.; Jen, Dixon T.; and Serra, John J., to Bunker Ramo Corporation. Method and apparatus for controlling a multi-mode segmented display. 3,792,462, Cl. 340-324.0ad.

Cassella, John N.; and Cavalier, James J., to Tremco Manufacturing Company, The. Method of detecting and repairing a structural roof damaged by subsurface moisture. 3,791,097, Cl. 52-741.000.

Cast Iron Soil Pipe Institute: *See—*
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Caterpillar Tractor Company: *See—*
Adams, Stanley B., 3,791,668.

Cathers, George I.; and Shipman, Calvin J., to United States of America, Atomic Energy Commission. Removal of iodine from nitric acid solutions. 3,792,154, Cl. 423-390.000.

Catherwood, Herbert C., 50% to Histed, William N. Rotary engine. 3,791,353, Cl. 123-8.330.

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Chai, Sooyoung, to Bell Telephone Laboratories, Incorporated. Solid-state diode array camera tube having electronic control of light sensitivity. 3,792,197, Cl. 178-7.100.

Chambers, Worthy L.: *See—*
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Chang, Hsin-Lan Wang, to Squibb, E. R., & Sons, Inc. Process for converting compounds containing a cyclic sulfur group to aldehydes or ketones. 3,792,043, Cl. 260-239.550.

Chapman, James Ronald: *See—*
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Chapman, Roland Philip. Centrifugal casting apparatus. 3,791,439, Cl. 164-292.000.

Chartier, Bernard: *See—*
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Chay, Dong Myung, to Du Pont de Nemours, E. I., and Company. Braunite-glass catalytic particles and method of preparation. 3,791,995, Cl. 252-471.000.

Chemische Werke Huls Aktiengesellschaft: *See—*
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Chemtrust Industries Corporation: *See—*
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Cherry, Albert J.; Neiman, Robert R.; Shattuck, Meredith D.; and Weiche, William J., to International Business Machines Corporation. Electrophotographic plate. 3,791,826, Cl. 96-1.500.

Cherry, Myron E. Vibration free piston engine. 3,791,227, Cl. 74-52.000.

Chester Electronics Laboratories, Incorporated: *See—*
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Chibata, Ichiro; Tosa, Tetsuya; and Sato, Tadashi, to Tanabe Seiyaku Co., Ltd. Process for the production of L-aspartic acid. 3,791,926, Cl. 195-30.000.

Chicago Bridge & Iron Company: *See—*
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Cho, Nakwon, to United States of America, Atomic Energy Commission. Tissue collector. 3,791,524, Cl. 210-232.000.

Choby, Edward J.: *See—*

Patterson, John F.; Bassler, Elmer A., Jr.; and Choby, Edward J., 3,791,466.

Chow, Hu, to Beatrice Foods Co. Pop-up sprinkler. 3,791,581, Cl. 239-205.000.

Chow, Kongta K., to United States of America, Navy, mesne. Wide-band traveling-wave microstrip meander-line light modulator. 3,791,718, Cl. 350-160.00r.

Christenson, Fredrick Charles: *See—*
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Ciba-Geigy AG: *See—*
Tschopp, Paul; Deuschel, Werner; Boragine, Carolo; and Kitzing, Rainer, 3,792,021.

Ciba-Geigy Corporation: *See—*
Cannon, John Allister; and Tracton, Arthur Allen, 3,792,112.
Iselin, Beat; Kappeler, Heini; Riniker, Bernhard; and Rittel, Werner, 3,792,033.
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Circuit Materials Division Dodge Industries, Inc.: *See—*
McKee, Ian K., 3,791,909.

Cirell, Rudy J.; and Scardena, Nance J. Tool for dressing grinding wheels and the like. 3,791,367, Cl. 125-11.00r.

Cities Service Company: *See—*
Newcombe, Jack; Dotson, Anderson O., Jr.; and Olechowski, Jerome Robert, 3,792,078.
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Claassen, John P.: *See—*
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Clarke, Ronald Albert William, to Klarcrete Limited. Impact apparatus for cutting grooves in roads. 3,791,699, Cl. 299-37.000.

Cleare, Ian Martin, to Smiths Industries, Limited. End fittings for flexible metallic conduits. 3,791,680, Cl. 285-174.000.

Clearwaters, Walter L., to United States of America, Navy. Stress relief insert for flexible towed array. 3,791,480, Cl. 181-.50a.

Clitheroe, Jay B., to Mineral & Chemical Resource Company. High energy gas-liquid contacting process. 3,791,104, Cl. 55-86.000.

Cloke, Robert L.: *See—*
Sordello, Frank J.; and Cloke, Robert L., 3,792,361.

Clugage, Robert G. Compression hold-down elements. 3,791,640, Cl. 269-136.000.

Coal Industry (Patents) Limited: *See—*
Smith, John Edwin Latham; and Witheridge, Philip Henry, 3,792,458.

Coates, David L.: *See—*
Bergmann, Paul F.; and Coates, David L., 3,791,355.

Cobb, Wayne E. Grain spreader. 3,791,592, Cl. 239-666.000.

Cochran, Chudleigh B., to Brown Oil Tools, Inc. Telescoping displacement joint. 3,791,449, Cl. 166-312.000.

Cody, Thomas E.; Davison, Arthur L.; Grohowski, Joseph A.; Horvath, Geza J.; and Linde, Theodore R., to Bethlehem Steel Corporation. Portable flame photometer and sampling probe. 3,791,743, Cl. 356-187.000.

Coffay, John B.: *See—*
Stana, Regis R.; Mitchell, Edward; and Coffay, John B., 3,791,526.

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Coleman Company, Inc., The: *See—*
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Colista, Dominic: *See—*
Salvati, John G.; Ricci, Louis N.; and Colista, Dominic, 3,792,315.

Colledge, Gary C. High speed, high temperature embossing machine and wheel therefor. 3,791,290, Cl. 101-31.000.

Collins, Dean R.; and Carter, David L., to Texas Instruments, Incorporated. Charge transfer solid state display. 3,792,465, Cl. 340-324.00r.

Collins, Robert F., to Kendall Company, The, mesne. Waterproof body converings with fluid receiving pockets. 3,791,382, Cl. 128-132.00d.

Colt Industries Operating Corporation, mesne: *See—*
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Combustion Engineering, Inc.: *See—*
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Commercial Decal, Inc.: *See—*
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Commissariat a l'Energie Atomique: *See—*
Borel, Joseph; Deutsch, Jean-Claude; Labrunie, Guy; and Robert, Jacques, 3,791,716.
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Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
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Compton, Charles E.; and Taplin, William H., III, to Dow Chemical Company, The. Method of making a battery cell having a coiled metallic foil cathode member. 3,791,868, Cl. 136-13.000.

Computer Transmission Corporation: *See—*
Harting, Stephen W., 3,792,256.

Conco Inc.: *See—*
Moeller, Ronald P., 3,791,536.

Condamine, Armand Eloi; and Rigal, Rene Jean Jacques Philippe, to Centre Technique du Cuir. Method and apparatus for making lasts. 3,790,978, Cl. 12-146.00l.

Condo, Albert C.: *See—*
Burt, Glenn R.; Condo, Albert C.; Odsather, Richard L.; and Eliason, Kay E., 3,791,443.

Conger, Marvin T.; Evans, Theodore A.; and Gordon, Larry A., to Goodyear Tire & Rubber Company, The. Antifoulant composition and method of preparation. 3,792,000, Cl. 260-3.500.

Conklin, Clayton E. Apparatus for orientating and stacking cup-like articles. 3,791,537, Cl. 214-6.500.

Conner, Charles J., to United States of America, Agriculture. Process for brown mineral dyeings of cellulosics without oxidative degradation (tendering), from a single bath. 3,791,786, Cl. 8-52.000.

Conner, James Marvin, to Combustion Engineering, Inc. Recess template. 3,791,040, Cl. 33-174.00g.

Conners, Richard G.: *See—*
Price, Frank D.; and Conners, Richard G., 3,792,193.

Conrad, Richard, to I-T-E Imperial Corporation. Timing control circuit for solid state protective relays for providing novel control of the pickup and timing circuits provided therein. 3,792,313, Cl. 317-27.00c.

Consolidation Coal Company: *See—*
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Container Corporation of America: *See—*
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Continental Oil Company: *See—*
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Control Data Corporation: *See—*
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Sauveur, Xavier de Saint, 3,792,467.

Cook, Harvey A., to TRW Inc. Electrical means for varying spark timing of an internal combustion engine. 3,791,357, Cl. 123-117.00r.

Cook, Terence John: *See—*
Davies, Owen Mansel; Olive, Martin Frederick; Cook, Terence John; and Hilder, Graham Keith, 3,791,960.

Coombes, William A.; Zavada, Richard A.; Hansen, John E.; Singleton, William A.; and King, Robert R., to Blaw-Knox Chemical Plants, Inc. Continuous hydrogenation of fatty materials. 3,792,067, Cl. 260-409.000.

Cooper, James H.: *See—*
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Corning Glass Works: *See—*
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Coscia, Anthony Thomas: *See—*
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Coulson, Dale Robert, to Du Pont de Nemours, E. I., and Company. Bis(2,3-dimethylenebutyl)amines. 3,792,092, Cl. 260-583.00h.

Coulter Chemistry, Inc., mesne: *See—*
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Cowan, Philip L., to Electrogasdynamics, Inc. Electrostatic paint spray system. 3,791,579. Cl. 239-3.000.

Coyle, Edward L.; and Murph, Howard L., to ACF Industries, Incorporated. Apparatus for opening and closing a door in the duct work of an air conditioned transportation vehicle. 3,791,168, Cl. 62-408.000.

CPC International Inc.: *See—*
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Crafford, John W.: *See—*
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Crafford, Thomas J.; and Crafford, John W., to Crafford Tool & Die Co. Pin extracting device. 3,791,004, Cl. 29-200.00d.

Crafford Tool & Die Co.: *See—*
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Crain, Graydon H. Mooring structure and method. 3,791,154, Cl. 61-46.000.

Crawford, Joseph A., to Advance Transformer Co. Three-lamp lead lag rapid start ballast apparatus. 3,792,310, Cl. 315-257.000.

Creter, Phillip G., to Itek Corporation. Physically developable copy medium with photoconductors and complexing agent. 3,791,829, Cl. 96-48.0pd.

Creuzet, Robert. Heat-extrusion method. 3,791,183, Cl. 72-46.000.

Cromer, Charles F.; Yoon, Kue Hong; and Dakin, Hayes O., Jr., to Westinghouse Electric Corporation. Gas operated blast valve for double-flow interrupters. 3,792,218, Cl. 200-148.00b.

Cronin, John C.: *See—*
Perry, Elijah Robert; Cronin, John C.; and Graybill, Howard W., 3,792,191.

Cronin, John C., to I-T-E Imperial Corporation. Conductive particle trap for high-power, gas-insulated transmission system. 3,792,188, Cl. 174-28.000.

Cross, James Waverley. Bracket construction for wall mounting of cabinets. 3,791,709, Cl. 312-245.000.

Cross, Raymond E. Die casting method. 3,791,440, Cl. 164-113.000.

Crovetti, Aldo Joseph; and Winn, Martin. Preparation of anilino iodomethylsulfones. 3,792,091, Cl. 260-577.000.

Crowden, William F.: *See*—
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Crown Controls Corporation: *See*—
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Culbertson, Alvin E.: *See*—
Cull, Duncan E.; and Culbertson, Alvin E., 3,792,461.

Culbertson, George W., to FMC Corporation. Cam operated clutch. 3,791,501, Cl. 192-93.00a.

Cull, Duncan E.; and Culbertson, Alvin E., to National Cash Register Company, The. Character display system. 3,792,461, Cl. 340-324.0ad.

Cunningham, Victor Ralph: *See*—
Hathorn, George Stuart; and Cunningham, Victor Ralph, 3,791,997.

Curington, Alfred R.; and Kammerer, Archer W., Jr. Percussion anvil bits. 3,791,462, Cl. 173-104.000.

Curtis, George F.; and Tatro, Henry J., Jr., to Colt Industries Operating Corporation, mesne. Machine gun. 3,791,256, Cl. 89-185.000.

Curtis, Lorin W., to Wagner Electric Corporation. Method for producing a multiple filamented cartridge lamp. 3,791,710, Cl. 316-17.000.

Curtis, Vernie. Anti-pollution device. 3,791,315, Cl. 110-8.00r.

Curtiss-Wright Corporation: *See*—
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Cushion Rail International, Inc.: *See*—
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Cushman, Donald R.; Oberright, Edward A.; and Edwards, Roy T.; deceased (by Edwards, Katherine S.; representative), said Cushman and said Oberright assors. to Mobil Oil Corporation. Wax emulsions for controlling transpiration in plants. 3,791,839, Cl. 106-68.000.

Cutler, Hymie. Feedrate control system for numerical control apparatus. 3,792,333, Cl. 318-571.000.

Cutters Machine Company, Inc.: *See*—
Benson, Robert W.; Chapman, James Ronald; Reed, Robert G.; and Smith, Hoyt L., 3,791,641.

C.V. Precision Tools Limited: *See*—
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D & P Minerals, Inc.: *See*—
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Daane, Robert A.: *See*—
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D.A.B. Industries, Inc.: *See*—
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Dahlgruen, Rolf: *See*—
Kaeding, Heinz; Fick, Heinz; and Dahlgruen, Rolf, 3,791,507.

Dahlquist, Nils Axel Viktor, to Kockums Mekaniska Verkstads AB. Control mechanisms for steam driven diaphragm valve sound transmitters. 3,791,339, Cl. 116-142.00r.

Dai-Ichi Kogyo Seiyaka Co., Ltd.: *See*—
Fumiaki, Yamagishi; Fumio, Endo; and Hideki, Ooi, 3,792,041.

Daimler-Benz Aktiengesellschaft: *See*—
Burckhardt, Manfred H.; Krohn, Hellmut; Grossner, Horst; and Florus, Hans-Jorg, 3,791,702.
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Daiwa Boseki Kabushiki Kaisha: *See*—
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Dakin, Hayes O., Jr.: *See*—
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Dale Electronics, Inc.: *See*—
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Dalena, Rudolph; and Walker, Donald F., to Hughes Aircraft Company. Scaled graphic line display on cathode-ray tube with uniform brightness. 3,792,304, Cl. 315-18.000.

Damijonaitis, Kestutis: *See*—
Ambler, E. Curtis; Damijonaitis, Kestutis; and Ketchpel, Paul A., 3,791,260.

Damon, Ronald L.; and Wiltshire, Arthur J., to Structural Fibers, Inc. Apparatus for forming fiber preforms. 3,791,783, Cl. 425-82.000.

Danfoss A/S: *See*—
Hansen, Gunnar Lyshoji, 3,791,765.

Danneman, Douglas L.: *See*—
Luedders, Wilmer L.; and Danneman, Douglas L., 3,792,068.

Darda, Helmut. Hydraulically operated apparatus for mechanical splitting of rock and the like. 3,791,698, Cl. 299-23.000.

Dart Industries, Inc.: *See*—
Fein, Marvin Michael; and Roderick, John James, 3,792,158.
Goodrich, Stanley R., Jr.; and Roethlisberger, Jerry M., 3,791,748.
Lammers, Sidney G., 3,792,138.

Dastur, Kavsy D., to Du Pont de Nemours, E. I., and Company. Adding fat adjuvants to foods in an ebullient freezant. 3,792,180, Cl. 426-524.000.

Datagraph A.G.: *See*—
Weidanz, Herbert; and Sandt, Gerhardt, 3,791,519.

Dathe, Joachim; Grasser, Leo; and Muller, Wolfgang, to Siemens Aktiengesellschaft. Method of producing PNP silicon transistor. 3,791,884, Cl. 148-187.000.

Dauenhauer, Florian F. Mechanical vine transfer and carrier. 3,791,389, Cl. 130-30.00d.

Davies, Owen Mansel; Olive, Martin Frederick; Cook, Terence John; and Hilder, Graham Keith, to British Petroleum Company, Limited, The. Isomerization of paraffin hydrocarbons. 3,791,960, Cl. 208-57.000.

Davis, Alwyn K.; and St. John, Ward A. Catamenial device and applicator therefor. 3,791,385, Cl. 128-263.000.

Davis, William Allen; and Burns, Gerald Edward, to Chicago Bridge & Iron Company. Offshore storage system. 3,791,152, Cl. 61-46.000.

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Davison, Sol; and Wales, Michael, to Shell Oil Company. Blends of certain block copolymers and neutralized copolymers of ethylene and an acrylic acid. 3,792,124, Cl. 260-876.00b.

Dawidowski, Gerhard. Method and apparatus of immobilizing a fractured femur. 3,791,380, Cl. 128-92.0bb.

De Angelo, Michael Anthony, to Western Electric Company, Incorporated. Method of improving the adherence of a metal deposit to a polyimide surface. 3,791,848, Cl. 117-47.00a.

De Castiglione, Roberto: *See*—
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De Koninck, Alphose. Sewing machine. 3,791,325, Cl. 112-213.000.

De Moore, Howard W. Sheet handling apparatus. 3,791,644, Cl. 271-80.000.

De Putter, Warner Jan, to Industriele Onderneming Wavin N.V. Pipe coupling. 3,791,678, Cl. 285-110.000.

De Voy, David D.; Barlow, George J.; and Klashka, John A., to Honeywell Information Systems, Inc. Deskewing buffer arrangement which includes means for detecting and correcting channel errors. 3,792,436, Cl. 340-146.10f.

Debero Kogyo Co., Ltd.: *See*—
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Deckel, Friedrich, Aktiengesellschaft: *See*—
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Deitch, Richard, to GTE Laboratories, Incorporated. Liquid-phase epitaxial growth under transient thermal conditions. 3,791,887, Cl. 148-172.000.

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Del Vecchio, Michael. Self-propelled water recreational vehicle. 3,791,335, Cl. 115-70.000.

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Demmel, Edward J.; and Owen, Hartley, to Mobil Oil Corporation. Selective catalytic cracking with crystalline zeolites. 3,791,962, Cl. 208-80.000.

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Depcrymski, John J., to I-T-E Imperial Corporation. Voltage grading shield for sharp angle transition joint. 3,792,187, Cl. 174-21.00c.

Deportes, Grenoble Charles: *See*—
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Derror, Fred L., to Mansfield Sanitary, Inc. Method to extricate intricate, ceramic shapes from multiple piece molds. 3,792,149, Cl. 264-336.000.

Des Champs, Nicholas Howard, to Donbar Development Corporation. Rotary heat exchanger. 3,791,369, Cl. 126-116.00r.

Deshay, Robert V.; Isaksen, Robert A.; and Sahni, Atam P., to Monsanto Company. Formable, Weldable coated article of manufacture. 3,791,850, Cl. 117-75.000.

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Dice, Dennis D., to Electronic Data Controls Corporation. Simulated dice game and control circuit therefor. 3,791,650, Cl. 273-138.00a.

Diciaccio, James J.; Gjertsen, John W.; and Nathanson, Alfred S., to Itek Corporation. Linear encoder. 3,791,037, Cl. 33-125.00r.

Dickson, George; and Westergaard, Robert K., to King-Seeley Thermos Co. Ice making machine. 3,791,163, Cl. 62-347.000.

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Dill, Dale R.; and Springer, William O., to Monsanto Company. Solid, non-caking, free-flowing styrene maleic anhydride compositions. 3,792,119, Cl. 260-874.000.

Dille, Kenneth L.; Saines, George S.; and Arkell, Alfred, to Texaco Inc. Jet fuel manufacture. 3,791,958, Cl. 208-15.000.

Dilley, Earl H. Electric outboard motor. 3,791,331, Cl. 115-17.000.

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Dixon, Richard Wayne; Hackett, William Harold, Jr.; and McGahan, Thomas Edward, to Bell Telephone Laboratories, Incorporated. Preferential etching in gap. 3,791,948, Cl. 204-129.750.

Dobesch, Franz Xaver, to VDO Tachometer Werke Adolf Schindling GmbH. Wind direction indicator for sailboats. 3,791,211, Cl. 73-188.000.

Dobras, Bruce W.; Vanderpool, James L.; and Humbarger, Ross C., to Monarch Marking Systems Company. Record reading system. 3,792,236, Cl. 235-61.11e.

Dobson, John C., to Formmet Corporation. Forged ring structure of multiple cast metals. 3,791,706, Cl. 308-216.000.

Dofek, Frantisek, to Zdarske strojirny a slevarny, narodni podnik. Shearing machine for cutting of band material. 3,791,244, Cl. 83-305.000.

Domer, Josef, to Siemens Aktiengesellschaft. Method and system of communication between several ground stations and a transponder satellite. 3,792,476, Cl. 343-7.500.

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Donjon, Jacques; Hazan, Jean-Pierre; and Marie, Gerard Joseph Marcel, to U.S. Philips Corporation. Electro-optic device comprising an optic image relay and method of manufacturing same. 3,792,259, Cl. 250-213.0vt.

Donot, Guy R. Machine for making coffee beverage. 3,791,284, Cl. 99-289.000.

Donovan, Daniel L., to Borg-Warner Corporation. Charge forming apparatus. 3,791,632, Cl. 261-35.000.

Donovan, John C.; Klein, Carl F.; Korta, Lawrence B.; and Krishnaiyer, Ramesh, to Johnson Service Company. Coded tone multiplexed alarm transmission system. 3,792,470, Cl. 340-409.000.

Dooley, Joseph F., to Pfizer Inc. Method for determining glucose with O-toluidine reagent containing an arsenic compound. 3,792,044, Cl. 23-230.00b.

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Duarte, Ruben G.; and Duarte, Manuel George. Flour mix for preparing tortillas. 3,792,174, Cl. 99-94.000.

Duchesne, Gonzague L. Hydroxy-terminated polybutadiene diisocyanate and triol composition. 3,792,003, Cl. 260-18.0tw.

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Dura Corporation: *See—*
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Durante, Anthony C.; and Macey, Frank G., to Chester Electronics Laboratories, Incorporated. Signal processing system for reading indicia over a wide depth of field. 3,792,235, Cl. 235-61.11e.

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Eiseman, Fred S., Jr.; Schenck, Leslie M.; and Beiswanger, John P. G., to GAF Corporation. Lubricating compositions containing sulfur containing phosphate esters. 3,791,985, Cl. 252-32.0fr.
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Falk, Richard A. Immersion sample cartridge. 3,791,219, Cl. 73-425.40r.

Falk, Richard A.; and Falk, William R. Pneumatic metal sampler. 3,791,220, Cl. 73-425.600.

Falk, William R.: *See—*
Falk, Richard A.; and Falk, William R., 3,791,220.

Fanger, Gene O., to National Cash Register Company, The. Minute capsules having walls of siliceous material-hydroxy-containing material complex and process for their manufacture. 3,791,987, Cl. 252-316.000.

Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See—*
French, Heinz; Albrecht, Konrad; and Schafer, Eugen, 3,791,811.
Reske, Eckart; Brinkmann, Ludwig; and Cherdron, Harald, 3,792,148.
Rushing, Heinrich; Duwel, Dieter; and Konig, Johann, 3,792,054.

Farkas, Robert D. Method of using a compressible die member to form patterns on a plastic sheet including the use of a liquid plastisol and dielectric heating. 3,791,906, Cl. 156-245.000.

Farkos, Robert A. Electromagnetic pump or motor device with axially spaced piston members. 3,791,770, Cl. 417-418.000.

Farrand Optical Co., Inc.: *See—*
Brenholdt, Irving R., 3,791,741.

Fastener Engineers, Inc.: *See—*
Alcock, Richard A.; and Shosie, Wayne A., 3,791,148.

Fattore, Vittorio; Mazzei, Marcello; and Notari, Bruno, to Snam Progetti S.p.A. Process for disproportionating the olefins. 3,792,107, Cl. 260-683.00d.

Faugeras, Anne-Marie; and Lambert, Andre, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Device for determining the direction of propagation of a plane wave. 3,792,479, Cl. 343-113.00r.

Fauser, Hans, to Societa Italiana Superior S.r.L. Device for cooking foods. 3,791,370, Cl. 126-25.00f.

Favre, John A.: *See—*
Trepka, William J.; and Favre, John A., 3,792,109.

Feichtinger, Anton: *See—*
Feichtinger, Johann; and Feichtinger, Anton, 3,791,675.

Feichtinger, Johann; and Feichtinger, Anton, to Gertsch AG, mesne. Safety ski binding. 3,791,675, Cl. 280-11.35t.

Feichtner, John D.: *See—*
Roland, George W.; and Feichtner, John D., 3,792,287.

Fein, Marvin Michael; and Roderick, John James, to Dart Industries, Inc. Metal halide-ester reaction process and compositions. 3,792,158, Cl. 424-65.000.

Felciai, Laurent. Multi unit dwelling structure. 3,791,081, Cl. 52-79.000.

Feldmann, Wilhelm: *See—*
Pfeiffer, Gerd; Kran, Hans-Peter; and Feldmann, Wilhelm, 3,791,184.

Feldwick, Raymond Douglas, to Grace, W. R., & Co. Preparation of a magnesium spinel catalyst base. 3,791,992, Cl. 252-463.000.

Fellows, Charles T.; Hermann, Stanley R.; and Hochwalt, Norman C., to National Cash Register Company, The. Transfer medium for producing scratch and smudge resistant marks. 3,792,111, Cl. 260-33.6sb.

Ferrara, Anne Marie, to Western Electric Company, Incorporated. Method of depositing a metal pattern on a surface. 3,791,340, Cl. 117-47.00a.

Ferrara, Anne Marie; and Kenney, John Thomas, to Western Electric Company, Incorporated. Method of selectively depositing a metal on a surface. 3,791,939, Cl. 204-15.000.

Ferro Corporation: *See—*
Borchert, Earl E., 3,791,974.

Fetissuf, Basile: *See—*
Philipp, Werner; Thomas, Andre; and Fetissuf, Basile, 3,790,975.

Fettis, Henry E.: *See—*
Gebel, Radames K. H.; and Fettis, Henry E., 3,792,363.

Feugnet, Jean-Pierre: *See—*
Barbier, Jean-Pierre; and Feugnet, Jean-Pierre, 3,791,035.

Fey, Maurice G.: *See—*
Hirayama, Chikapa; and Fey, Maurice G., 3,791,949.

Fick, Heinz: *See—*
Kaeding, Heinz; Fick, Heinz; and Dahlgruen, Rolf, 3,791,507.

Finkel, Bernard G.; Levy, Arthur L.; and Keyloun, Carol, to Scientific Specialties, Ltd. Method and apparatus for determining triglyceride level. 3,791,791, Cl. 23-230.00b.

Finsterwalder, Ulrich; and Bomhard, Helmut, to Dyckerhoff & Widmann Aktiengesellschaft. Multi-story building and method of construction therefor. 3,791,093, Cl. 52-745.000.

First, Antonin, to CKD Praha, oborovy podnik. Chopper-controlled scheme for infinite field weakening of series motors. 3,792.326, Cl. 318-138.000.

Firth, William Charles, Jr.: *See—*
Panzer, Hans Peter; Firth, William Charles, Jr.; Coscia, Anthony Thomas; and Palmer, Lucille Elma, 3,792,027.

Fischer Holdings Ltd.: *See—*
Fischer, Karl Otto Paul, 3,791,990.

Fischer, Karl Otto Paul, to Fischer Holdings Ltd. Oil absorbent. 3,791,990, Cl. 252-427.000.

Fisons Limited: *See—*
Cairns, Hugh; and Hunter, Dennis, 3,792,063.

Fitzsimons, Ogden; Radden, Charles O.; and Hindman, George J., to Petrocon Corporation. Process for re-refining used petroleum products. 3,791,965, Cl. 208-179.000.

Flamagas, S.A.: *See—*
Gili, Ricardo Aguirre, 3,791,548.

Fleischer, Paul Egon; and Hilberman, Dan, to Bell Telephone Laboratories, Incorporated. Active controllable filter circuit using variable transconductance amplifier. 3,792,367, Cl. 330-98.000.

Fleischmann, Erwin; and Watzlawek, Karlheinz, to Lohmann & Stolterfoht Aktiengesellschaft. Elastic shaft clutch. 3,791,497, Cl. 192-30.00v.

Fleisher, Henry. Apparatus for preparing a painted metal surface for repainting. 3,791,078, Cl. 51-5.000.

Fleming, Ora Ray, to Teledyne, Inc. Electrical relay. 3,792,388, Cl. 335-135.000.

Fliesser, Engelbert, to Agfa-Gevaert AG. Intermittent for cinematographic apparatus. 3,791,566, Cl. 226-68.000.

Flinn & Dreffein Engineering Co.: *See—*
Gamble, Slade B.; and Kelly, Richard A., 3,791,796.

Florus, Hans-Jorg: *See—*
Burckhardt, Manfred H.; Krohn, Hellmut; Grossner, Horst; and Florus, Hans-Jorg, 3,791,702.

Floyd, Roger M.: *See—*
Bamburg, Robert A.; Duncan, Farris N.; and Floyd, Roger M., 3,791,562.

FMC Corporation: *See—*
Culbertson, George W., 3,791,501.
MacHenry, Richard, 3,791,745.

Focke & Pfuhl: *See—*
Focke, Heinz, 3,792,209.

Focke, Heinz, to Focke & Pfuhl. Switch sensing device for sensing presence of seal on containers. 3,792,209, Cl. 200-61.410.

Folgero, Kare; and Hellsing, Sven, to Allmanna Svenska Elektriska Aktiebolaget. Channel-type induction furnace. 3,792,185, Cl. 13-29.000.

Folkerth, Ilden R., to Michigan Instruments, Inc. Gas cylinder holder. 3,791,403, Cl. 137-343.000.

Food Technology, Inc.: *See—*
Glabe, Elmer F., 3,792,173.

Ford Motor Company: *See—*
Hellriegel, Edmund; and Pfadenhauer, Dieter, 3,791,693.
Stockton, Thomas R., 3,791,138.

Forgione, Peter Salvatore; Polistina, Rocco Alberto; and Schmitt, Edward Emil, to American Cyanamid Company. Entrapped carrier bound enzymes. 3,791,927, Cl. 195-63.000.

Formmet Corporation: *See—*
Dobson, John C., 3,791,706.

Forrester, Richard C., III: *See—*
Lynn, Scott; and Forrester, Richard C., III, 3,792,153.

Foster, Douglas E., to Didier, Wm., Mfg. Co. Submarine type, self-propelled suction sweeper. 3,790,979, Cl. 15-1.700.

Foster, Edward L.: *See—*
Stone, Charles W.; and Foster, Edward L., 3,791,627.

Fouces, Juan M.: *See—*
Fouces, Manuel; and Fouces, Juan M., 3,791,181.

Fouces, Manuel; and Fouces, Juan M. Brake locking device for preventing theft of self-propelled vehicles. 3,791,181, Cl. 70-202.000.

Fouche, Jean; and Leger, Andre, to Rhone-Poulenc S.A. Dihydrodibenzo [b,f] azepine derivatives. 3,792,042, Cl. 260-239.00d.

Fouquet-Werk Franz & Planck: *See—*
Kohler, Pius; and Kuhn, Falk, 3,791,176.

Fowler, Larry G., to Sugar Cane Growers Cooperative of Florida. Two row cutter windrower harvesting machine. 3,791,114, Cl. 56-13.900.

Fox, Charles L., Jr., to Research Corporation. Burn ointment comprising silver sulfadiazine and collagenase. 3,792,161, Cl. 424-94.000.

Fox, Richard; Williams, Darrel Andrew; and Wisinski, Adam Prus, to ICI Australia, Limited. Method of filling boreholes with viscous slurried explosives. 3,791,255, Cl. 86-20.00c.

Fox, Shirl S., to Dental Designs. Cuspidor and dental console for use therewith. 3,790,971, Cl. 4-263.000.

Foye, Albion G. Hopper-type mortar spreader. 3,791,559, Cl. 222-176.000.

Frank, Charles E.; and Murib, Jawad H., to National Distillers and Chemical Corporation. Process for the preparation of acrylic and methacrylic acids. 3,792,086, Cl. 260-533.00n.

Frank, Edmund: *See—*
Toman, Joseph R.; and Frank, Edmund, 3,792,276.

Frank, Robert L.; Martin, Sidney G.; and Smith, Clayton S., to Morton-Norwich Products, Inc. Process for the recovery of non-ferrous metal values from sulfide ores and the reduction of gaseous emissions to the atmosphere therefrom. 3,791,812, Cl. 75-9.000.

Franke, Friedrich Hermann: *See—*
Wenzel, Werner; Franke, Friedrich Hermann; and Jager, Ramund, 3,791,994.

Frankenfeld, John W.; and Miller, Sanford A., to Esso Research and Engineering Company. High energy food supplements comprising linear aliphatic 1,3-diols. 3,791,241, Cl. 99-2.00r.

Frauson, William O.: *See—*
Taylor, William; Frauson, William O.; and Chinowsky, Stanley, 3,791,878.

Frazier, James L.; and Polacek, Richard, to Houdaille Industries, Inc. Machine tool tooling. 3,791,257, Cl. 90-11.00d.

Frazier, Larry Vane W., to United States of America, Navy. Underwater data transmission system. 3,792,421, Cl. 340-4.00r.

Freed, Meier E.: *See—*
Potoski, John R.; and Freed, Meier E., 3,792,053.

Fregnan, Gian Carlo: *See—*
Bernardi, Luigi; De Castiglione, Roberto; Fregnan, Gian Carlo; and Goffredo, Onofrio, 3,792,032.

Freightliner Corporation: *See—*
Self, Kenneth W.; Chew, Norman B.; and Twyman, Bill T., 3,791,664.

French, Heinz; Albrecht, Konrad; and Schafer, Eugen, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Storable highly concentrated pesticides and process for their manufacture. 3,791,811, Cl. 71-120.000.

Freya-Plastic & Franz Delbrousk: *See—*
Delbrouck, Franz; and Nickel, Wilfried, 3,791,549.

Fried, John H.; and Harrison, Ian T., to Synthex Corporation. Naphthyl alkanols and derivatives thereof, methods of use thereof, and processes for the preparation thereof. 3,792,167, Cl. 424-337.000.

Fried, Peter I.: *See—*
Swersey, Burt L.; and Fried, Peter I., 3,791,467.

Friedlander, Erich Siegfried, to Associated Electrical Industries Limited. A.C. power transmission systems. 3,792,288, Cl. 307-102.000.

Friedman, Mitchell, to Bio/Physics Systems, Inc. Digital fluidic amplifier particle sorter. 3,791,517, Cl. 209-74.00r.

Friedman, Sanford J. Animal shield. 3,791,383, Cl. 128-154.000.

Friedmann, Charles Aubrey; Hofer, Peter; and Lange, Winthrop E., to Mundipharma AG. Bis-(phosphorylated anthralin) compounds and process for preparing same. 3,792,129, Cl. 260-927.00r.

Friedmann, Paul G.; and Cohen, William C., to Leeds & Northrup Company. Adaptive feed forward-feedback control of the concentration of a selected ion of a solution. 3,791,793, Cl. 23-230.00a.

Fries, Paul; and Moritz, Konrad, to Siemens Aktiengesellschaft. Cooling apparatus for flat semiconductors using one or more heat pipes. 3,792,318, Cl. 317-234.00r.

Fries, William: *See—*
Kunin, Robert; and Fries, William, 3,791,866.

Frigo, Richard I.; and Crowden, William F. Drum. 3,791,249, Cl. 84-411.000.

Fritch, Junior L.; and Brandeberry, Don R., to Robinair Manufacturing Corporation. Vacuum pump. 3,791,780, Cl. 418-60.000.

Fromuth, Harry C., Jr., to Rohm & Haas Company. Polyphenylene ether resins containing a butadiene-acrylic-styrene polymer modifier. 3,792,122, Cl. 260-876.00r.

Fuchiwaki, Yutaka; and Nishikaji, Takashi, to Mitsubishi Chemical Industries Limited. Process for preparing a cross-linked porous copolymer. 3,791,999, Cl. 260-2.50m.

Fudro, Stanley J., to Toys 'N Things, Inc. Egg decorating device. 3,792,163, Cl. 33-21.00d.

Fuji Photo Film Co., Ltd.: *See—*
Akashi, Goro; and Hirakawa, Takashi, 3,791,608.
Murakoshi, Makoto, 3,792,440.

Fuji Shashin Koki Kabushiki Kaisha: *See—*
Ito, Haruhiro, 3,791,643.

Fujii, Yoshifusa: *See—*
Tsujimoto, Kayoshi; and Fujii, Yoshifusa, 3,792,484.

Fujita, Kinji; and Mitsui, Hironitsu, to Kabushiki Kaisha Suwa Seikosha. Temperature compensated quartz oscillator circuit. 3,792,377, Cl. 331-116.00r.

Fujitsu Limited: *See—*
Honda, Masanori, 3,791,717.

Fujiwara, Motokichi: *See—*
Inoue, Katsumi; and Fujiwara, Motokichi, 3,791,056.

Fujiyama, Tetsuo; and Hamamoto, Takashi, to Toyo Kogyo Co., Ltd. Rotary piston internal combustion engine. 3,791,781, Cl. 418-179.000.

Fukada, Tetsuo: *See—*
Shirota, Minoru; Fukada, Tetsuo; Ogata, Mayumi; Takahashi, Toshiaki; and Yamada, Hiromi, 3,792,172.

Fukatsu, Shunzo; Ishikawa, Tetsuo; Miura, Taro; Niida, Taro; Noniya, Bunzo; and Koeda, Takemi, to Meji Seika Kaisha, Ltd. Mono-acetyl derivatives of antibiotic SF-837 and SF-837-A2 substances and production thereof. 3,792,035, Cl. 260-210.0ab.

Fukinuki, Takahiko: *See—*
Miyata, Masachika; and Fukinuki, Takahiko, 3,792,355.

Fukushima, Hideaki: *See—*
Suzuki, Yoshio; Aono, Shunji; and Fukushima, Hideaki, 3,792,055.

Fuller, Alvin W., to Hubbell, Harvey, Incorporated. Weatherproof cover for electrical cable connector. 3,792,415, Cl. 339-60.00r.

Fuller, Howard J., to Worcester Controls Corporation. Interface for multiplex motor control systems. 3,792,332, Cl. 318-562.000.

Fumiaki, Yamagishi; Fumio, Endo; and Hideki, Ooi, to Dai-Ichi Kogyo Seiyaka Co., Ltd. Process for synthesizing sucrose esters of fatty acids. 3,792,041, Cl. 260-234.00r.

Fumio, Endo: *See—*
Fumiaki, Yamagishi; Fumio, Endo; and Hideki, Ooi, 3,792,041.

Furlong, Louis E.; Zimmerman, Abraham A.; and Shannon, Hugh F., to Esso Research and Engineering Company. Enchancing the operation of a gasoline engine. 3,791,066, Cl. 44-66.000.

Furnas Electric Company: *See—*
Peluchiwski, John J.; and Walstad, Dennis C., 3,792,402.

Furr, Tommy R., to Oxford Industries, Inc. Method and apparatus for forming random stripe in knitting garments. 3,791,173, Cl. 66-20.000.

Gachot, Jean. Pressure regulators for compressed-air circuits. 3,791,399, Cl. 137-116.000.

GAF Corporation: *See—*
Eiseman, Fred S., Jr.; Schenck, Leslie M.; and Beiswanger, John P. G., 3,791,985.

Gahler, Charles C., to Smith, X. S., Inc. Plastic covered building structures. 3,791,076, Cl. 52-2.000.

Gaiduchik, Vladimir Olegovich: *See—*
Afanasiev, Vadim Nikolaevich; Gaiduchik, Vladimir Olegovich; and Gruzin, Pavel Lukich, 3,792,252.

Gallo, Charles F., Jr., to Xerox Corporation. Corona wire apparatus. 3,790,999, Cl. 29-25.150.

Galpern, Grigary Davidovich: *See—*
Burmistrova, Tamara Petrovna; Bardina, Tatyana Alexandrovna; Galpern, Grigary Davidovich; Karaulova, Elena Nikolaevna; Luchai, Nonna Alexandrovna; Terpilovsky, Nikolai Nikolaevich; and Khitrik, Adolf Alexandrovich, 3,792,095.

Gamble, Slade B.; and Kelly, Richard A., to Flinn & Dreffein Engineering Co. and Anti-pollution apparatus. . 3,791,796, Cl. 23-277.00c.

Gander, Frederick W.; and Garlington, William D., to Du Pont de Nemours, E. I., and Company. Granular polyketone preparation. 3,791,890, Cl. 260-61.000.

Garbi, Frank. Electromagnetic drive system. 3,792,295, Cl. 310-46.000.

Garcea, Gian Paolo, to Alfa Romeo S.p.A. Regulator based on the control of a member having variable impedance surface-characteristics, particularly for feed adjustment in I.C. engines. 3,792,343, Cl. 323-82.000.

Garden Industries, Inc.: *See—*
Barrett, Robert, 3,791,421.

Gardner, Conrad O. Highway drainage and exhaust system. 3,791,752, Cl. 404-2.000.

Gardner, Keith L.; and La Baw, Kenneth B., to United States of America, Navy. Lateral photodetectors. 3,792,257, Cl. 250-211.00j.

Gardner-Denver Company: *See—*
Strecker, Gerald L.; and Schultz, Dennis L., 3,791,149.
Workman, William, Jr., 3,791,459.

Garlinghouse, Leslie H. Gate operating system for concrete buckets. 3,791,690, Cl. 294-71.000.

Garlington, William D.: *See—*
Gander, Frederick W.; and Garlington, William D., 3,791,890.

Garrett Corporation, The: *See—*
Kartinen, Ernest J.; and Lewis, Roger W. (said Lewis assor. to), 3,791,575.
Summer, James R., 3,791,764.

Garrett, Jim C.: *See—*
O'Dea, Orrin B.; and Hanneman, Thomas W., 3,792,210.

Garrett, John W.; Alexander, Milton; and Riepenhoff, Ralph R., to United States of America, Air Force. Aircraft ejection seat actuation system. 3,791,610, Cl. 244-122.00a.

Gates, John Warburton, Jr.: *See—*
Bush, Walter Monroe; Gates, John Warburton, Jr.; and Newmiller, Robert John, 3,791,827.

Gattus, Jean; and Mallet, Maurice, to Rhone-Poulenc S.A. Films of polyamide-imides having a uniplanar axial structure. 3,792,019, Cl. 260-47.0cp.

Gayot, Jean: *See—*
Bardet, Serard; Gayot, Jean; and Bouee, Vincent, 3,791,304.

Geary, Carl H., to Carrier Corporation. Turbine turning mechanism. 3,791,231, Cl. 74-142.000.

Gebauer, Thomas Edward: *See—*
Hanser, Paul Edmund; and Gebauer, Thomas Edward, 3,791,457.

Gebel, Radames K. H.; and Fettis, Henry E., to United States of America, Air Force. Controllable edge sharpening system for time sequential signals. 3,792,363, Cl. 328-164.000.

Gebr. Bellmer KG: *See—*
Kollmar, Ulrich, 3,791,268.

Gebr. Happich GmbH: *See—*
Dietz, Conter, 3,792,248.

Geiger, Julius: *See—*
Von Bonin, Wulf; Geiger, Julius; Meinhardt, Gunter; Meyer, Karl-Otto; Wagenknecht, Werner; and Himmelmann, Wolfgang, 3,791,831.

Gelbenegger, Franz. Angle adjustment unit for prostheses and ortheses. 3,790,965, Cl. 3-21.000.

Geller, Myer: *See—*
Altman, Daniel E.; Barstow, Glidden J.; and Geller, Myer, 3,792,373.

Gemander, Georg: *See—*
Schmaldienst, Peter; and Gemander, Georg, 3,791,363.

Gemmill, Robert M., Jr.; and Schick, John W., to Mobil Oil Corporation. Substituted indans. 3,792,096, Cl. 260-612.00r.

Gendron, Wilfred H., to United States Envelope Company. Two-way mailing item and continuous form assembly thereof. 3,791,572, Cl. 229-69.000.

General Automation Manufacturing Incorporated: *See—*
Warren, Wesley S., 3,791,755.

General Dynamics Corporation: *See—*
Tubb, Irvin L., 3,791,970.

General Electric Company: *See—*
Abolins, Visvaldis; Erhardt, Peter F.; and Holoch, Klaus E., 3,792,121.
Abolins, Visvaldis; and Reinhard, Donald L., 3,792,123.
Bilski, Richard E., 3,791,657.
Ettlinger, Louis F.; and Barger, Donald R., 3,792,404.
Lewis, Robert E.; and Hanson, Lloyd A., 3,791,982.
Lister, John W., 3,792,305.
Loika, Alexander, Jr., 3,792,353.
Price, Frank D.; and Conners, Richard G., 3,792,193.
Rice, Keith E., 3,791,203.
Summers, Robert M.; and Holoch, Klaus E., 3,792,120.
Zdaniewski, Joseph J., 3,792,012.

General Foods Corporation: *See—*
Moreno, Victor; and Lysak, David A., 3,791,283.

General Motors Corporation: *See—*
Zens, John F., 3,791,671.

Geomet, Incorporated: *See—*
Moyer, Rudolph H.; and Sibbett, Donald J., 3,791,933.

Gertsch AG, mesne: *See—*
Feichtinger, Johann; and Feichtinger, Anton, 3,791,675.

Gess, Larry C. Apparatus for filling, labeling, and closing containers, such as syringes. 3,791,009, Cl. 29-208.00b.

Gestetner Copiers Limited: *See—*
Mihalik, Nandor, 3,791,731.
Mikalik, Nandor; Moss, Andrew Anthony; and Prince, John Charles Henry, 3,791,732.

Gibby, Michael G.; Pines, Alexander; and Waugh, John S., to Massachusetts Institute of Technology. Proton-enhanced nuclear induction spectroscopy. 3,792,346, Cl. 324-.50r.

Gidge, Lester, to Monsanto Company. Method of heat sealing porous materials. 3,791,908, Cl. 156-273.000.

Gidick, Ward F., to Koppers Company, Inc. Pollution-free coal charging apparatus. 3,791,320, Cl. 110-101.00r.

Giery, Edward G., Jr.: *See—*
Schrage, Donald J.; and Giery, Edward G., Jr., 3,791,317.

Gilani, Syed S. H.; and Murray, Donald W., to Esso Research and Engineering Company. Grease thickened with lithium soap of hydroxy fatty acid and lithium salt of aliphatic dicarboxylic acid. 3,791,973, Cl. 252-41.000.

Gilbreath, Dennis R.; and Kralstein, Sheldon D., to United Aircraft Corporation. Vector angle computer. 3,792,246, Cl. 235-186.000.

Giles, Charles E. Collet and collet fixture. 3,791,661, Cl. 279-43.000.

Gili, Ricardo Aguirre, to Flamagas, S.A. Automatic ashtray. 3,791,548, Cl. 220-20.500.

Gilles, Roger; and Nougarede, Francis, to Entreprise de Recherches et d'Activites Petrolieres (Elf). Slider-type assembly device. 3,790,993, Cl. 24-201.00c.

Gillespie, Gerald W.: *See—*
Blumenthal, Stanley P.; Krasnick, Solomon; and Gillespie, Gerald W., 3,792,437.

Gillette Company, The: *See—*
Webster, Mild E., 3,791,098.

Gillies, George A., to Shell Oil Company. Hydrogenated block copolymers and process for preparing same. 3,792,127, Cl. 260-880.00b.

Gilmore, Thomas P., to Allis-Chalmers Corporation. D.C. to D.C. converter. 3,792,337, Cl. 321-2.000.

Girling Limited: *See—*
Nicholls, Lawrence George, 3,791,407.
Tickle, Colin John Frederick, 3,791,491.

Gjertsen, John W.: *See—*
Diciaccio, James J.; Gjertsen, John W.; and Nathanson, Alfred S., 3,791,037.

GKN Sankey Limited: *See—*
Bowring, David John, 3,791,425.

GKN Transmissions Limited: *See—*
Pagdin, Brian Colin, 3,791,589.

Glabe, Elmer F., to Food Technology, Inc. Process of reducing shrinkage and retaining moisture and juices in meat products and products produced thereby. 3,792,173, Cl. 426-92.000.

Glacier Ware, Inc.: *See—*
Devlin, Edward J., 3,791,159.

Gladish, James O.: *See—*
Ancel, Selwyn J.; and Gladish, James O., 3,791,977.

Glass, Alastair Malcolm: *See—*
Auston, David Henry; and Glass, Alastair Malcolm, 3,792,379.

Glass, Marvin, & Associates: *See—*
Glass, Marvin I.; Morrison, Howard J.; and Kaelin, Bette M., 3,791,662.

Glass, Marvin, Associates: *See—*
Licitis, Gunars; and Rodmaker, Gerald M., 3,791,656.

Glass, Marvin I.; Morrison, Howard J.; and Kaelin, Bette M., to Glass, Marvin, & Associates. Toy vehicle with removable soft body portion. 3,791,662, Cl. 280-1.100.

Glaswerke Schuller GmbH: *See—*
Schuller, Wolfgang; and Veeh, Karl, 3,791,919.

Glaxo Laboratories Limited: *See—*
Arkley, Vincent; Eardley, Stephen; and Long, Alan Gibson, 3,792,047.

Gleason, Edward H.; and Guziak, Leonard F. Flame retardant latex. 3,792,007, Cl. 260-29.07p.

Glindmeyer, Friedrich; Hennenberg, Wilhelm; and Limpens, Karl, to Prym, William, Werke KG. Method and apparatus for production of a zipper by weaving. 3,791,417, Cl. 139-11.000.

Gloucester Engineering Co., Inc.: *See—*
Schott, Charles M., Jr., 3,791,567.
Skelding, Geoffrey Harry; and Tracey, Wilbur G., 3,791,294.

Glover, John Benjamin, to Hepworth Iron Comapny, Limited, The. Pipe fittings. 3,791,679, Cl. 285-155.000.

Glutz, Bernhard: *See—*
Martin, Forst G.; Glutz, Bernhard; and Linz, Hans, 3,790,995.

G.M.T. S.A.: *See—*
Lefebvre, Pierre Albert, 3,792,296.

Godderidge, Jean. Devices for unwinding filamentary material from a bobbin or spool. 3,791,119, Cl. 57-34.00r.

Goehring, Clifford Clayton; Hart, Arthur Clifford, Jr.; and Wooldridge, Derek, to American Can Company. Multilayer laminated polyethylene copolymer-polyamide film. 3,791,915, Cl. 161-227.000.

Goerden, Leonard; and Gromping, Franz, to Bayer Aktiengesellschaft. Process and apparatus for the production of hollow bodies from reaction resins, which are reinforced with fibres. 3,791,900, Cl. 156-171.000.

Gof, Mohammed S. Water bike. 3,791,332, Cl. 115-27.000.

Goffe, William L., to Xerox Corporation. Removal of background from an imaged migration layer. 3,791,822, Cl. 96-1.0ps.

Goffredo, Onofrio: *See—*
Bernardi, Luigi; De Castiglione, Roberto; Fregnan, Gian Carlo; and Goffredo, Onofrio, 3,792,032.

Gold, Nicholas. Three-dimensional board game apparatus. 3,791,649, Cl. 273-131.0ad.

Goldbaum, Elliott: *See—*
Scowen, Kenneth J.; and Goldbaum, Elliott, 3,792,249.

Goldberg, Morris: *See—*
Schwartz, Robert; and Goldberg, Morris, 3,792,281.

Goldfarb, Harold; and Valsamakis, Christopher, to North American Rockwell Corporation. Solder flux composition. 3,791,879, Cl. 148-23.000.

Goldfarb, Harold; and Valsemakis, Christopher. Solder flux composition. 3,791,886, Cl. 148-23.000.

Goldman, Maurice A., to Synagex Corporation. Refining feed unit for a carding machine. 3,790,990, Cl. 19-105.000.

Goldor Topsoe A/S: *See—*
Rostrup-Nielsen, Jens Richard, 3,791,993.

Goldsmith, Clifton R., to Phillips Petroleum Company. Process for establishing reactive contact between reactive ingredients. 3,791,980, Cl. 252-188.30r.

Goldstein, Irving; and Rambauske, Werner R. Improved optical cavity for a laser. 3,792,370, Cl. 331-94.500.

Golze, Richard R., to Rockwell International Corporation. Vehicle wheel trim. 3,791,700, Cl. 301-37.0cm.

Goodhart, Frank; and Campbell, William A., to Warner-Lambert Company. Dissolution testing device. 3,791,222, Cl. 73-432.00r.

Goodrich, Stanley R., Jr.; and Roethlisberger, Jerry M., to Dart Industries Inc. Ball joint with manually operable, sensible wear indicator. 3,791,748, Cl. 403-27.000.

Goodyear Tire & Rubber Company, The: *See—*
Conger, Marvin T.; Evans, Theodore A.; and Gordon, Larry A., 3,792,000.
Duddey, James E.; Hahn, Maneung; and Schirmer, Joseph P., Jr., 3,792,015.

Gordon, Larry A.: *See—*
Conger, Marvin T.; Evans, Theodore A.; and Gordon, Larry A., 3,792,000.

Gorgens, Joseph E.; and Heske, William A. Motion responsive electrical control apparatus. 3,792,408, Cl. 338-91.000.

Gorin, Everett; Kulik, Conrad J.; and Lebowitz, Howard E., to Consolidation Coal Company. Conversion of coal to clean fuel. 3,791,956, Cl. 208-8.000.

Gorl, Richard; and Blase, Helmut, to Rheinstahl AG. Adjustable width crane supporting structure. 3,791,530, Cl. 212-145.000.

Gorman, John P., to Cast Iron Soil Pipe Institute. Vented sanitary trap unit. 3,791,401, Cl. 137-216.200.

Goswami, Jagadish C.; and Jin, Jung Il, to Stauffer Chemical Company. Thermoplastic polymers containing post chlorinated vinyl halide-bis(hydrocarbyl)vinyl phosphonate copolymers. 3,792,113, Cl. 260-857.000.

Goto, Yosimasa: *See—*
Sugiura, Masatoshi; Hirabayashi, Masaya; and Goto, Yosimasa, 3,791,833.

Gott Manufacturing Co., Inc.: *See—*

Branscum, Tony E., 3,791,547.

Gottfried Bischoff Bau Kompl. Gasreinigungs und Wasseruckkuhlanlagen KG: *See—*
Hausberg, Gerhard; and Hegemann, Karl-Rudolf, 3,791,108.

Goughnour, Roy Robert, to Aukerman, A. C., Co. Method for slip-forming walls of asymmetrical transverse cross section. 3,792,133, Cl. 264-33.000.

Grace Machinery Company, Incorporated: *See—*
Hinds, Horace, Jr., 3,791,630.

Grace, W. R., & Co.: *See—*
Brown, Patrick Michael; and May, Vernon Bruce, 3,791,836.
Eastes, Frank E., 3,791,916.
Feldwick, Raymond Douglas, 3,791,992.
Patil, Arvind S.; Rice, Rip G.; and Raus, John W., 3,791,969.

Grad-Line Inc.: *See—*
Long, George E.; Johnson, Floyd C.; and Reese, Dennis L., 3,791,452.

Graf, Werner: *See—*
Nitzsche, Siegfried; Zeller, Norbert; Graf, Werner; and Bauer, Ignaz, 3,792,071.

Graham, James T.; and Hackstock, Fred W., to Bendix Corporation, The. Overload mechanism for cam operated linkages in a multistation assembly machine. 3,791,010, Cl. 29-208.00c.

Graham, Ralph. Aerials. 3,792,480, Cl. 343-781.000.

Gramann, Wolfgang, to Licentia Patent-Verwaltungs-G.m.b.H. Apparatus for liquid phase epitaxy. 3,791,344, Cl. 118-421.000.

Grant, Glenn D., to Amdahl Corporation. Clock apparatus and data processing system. 3,792,362, Cl. 328-72.000.

Grant, Whitney I., to Vilter Manufacturing Corporation. Reciprocating cylinder type compressor having unloading means. 3,791,776, Cl. 417-440.000.

Grasemann, Horst; and Rose, Hermann, to Chemische Werke Huls Aktiengesellschaft. Continuous dehydration apparatus. 3,791,435, Cl. 159-25.000.

Graser, Fritz, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Perylene-3,4,9,10-tetracarboxylic acid-bis-(2-amide-4-methylpyrimidine. 3,792,051, Cl. 260-256.40n.

Grasman, Rudolf; and Hell, Walter, to Waagner-Biro Aktiengesellschaft. Force-measuring systems. 3,791,206, Cl. 73-141.00r.

Grasser, Leo: *See—*
Dathe, Joachim; Grasser, Leo; and Muller, Wolfgang, 3,791,884.

Grassl, Manfred: *See—*
Stengel, Max; Kollmer, Werner; and Grassl, Manfred, 3,792,189.

Graybill, Howard W.: *See—*
Perry, Elijah Robert; Cronin, John C.; and Graybill, Howard W., 3,792,191.

Great Canadian Oil Sands, Limited: *See—*
Bierwith, Stanton F., 3,791,054.

Green, Geoffrey; Overell, Brian George; and Pratt, Anthony Michael, to Beecham Group, Limited. Process for preparing injectionable compositions. 3,792,159, Cl. 424-91.000.

Green, William C.: *See—*
Burns, Jerome Q.; and Green, William C., 3,791,628.

Greenberger, Joseph Irwin, to Wean United, Inc. Method of and apparatus for handling fiberboard. 3,791,538, Cl. 214-16.600.

Gregg, Paul S.: *See—*
Smart, William L.; and Gregg, Paul S., 3,792,409.

Gregory, Robert O.: *See—*
Pederson, Richard H.; and Gregory, Robert O., 3,792,376.

Grey, Udo; and Klimmer, Winfried, to Jenoptik Jena G.m.b.H. Coordinate position measuring by imaging a movable grating onto a parallel reference grating. 3,791,742, Cl. 356-169.000.

Grienauer, Heinrich, to Siemens Aktiengesellschaft. Slit screen for X-ray apparatus used in determining crystal topography. 3,792,269, Cl. 250-272.000.

Griffin, Gordon Douglas. Form of tined shaft and constructions of composting machine. 3,791,593, Cl. 239-667.000.

Griffolyn Company, Incorporated: *See—*
Yaeger, Luther L.; and Chen, Wei-Gwo, 3,791,911.

Grille, Thomas; Krakauer, Daniel; and Krakauer, Edwin G., to Kay Manufacturing Corporation. Furniture spring clip and installation. 3,791,749, Cl. 403-188.000.

Grohe, Hans, KG: *See—*
Buzzi, Gunter, 3,791,588.

Grohowski, Joseph A.: *See—*
Cody, Thomas E.; Davison, Arthur L.; Grohowski, Joseph A.; Horvath, Geza J.; and Linde, Theodore R., 3,791,743.

Gromping, Franz: *See—*
Goerden, Leonard; and Gromping, Franz, 3,791,900.

Groppel, Dieter: *See—*
Sturm, Ferdinand V.; Naschwitz, Walter; Rummel, Werner; and Groppel, Dieter, 3,791,872.

Grosky, Stephen A.: *See—*
Casey, Richard C.; Duggan, Robert J.; Grosky, Stephen A.; Jen, Dixon T.; and Serra, John J., 3,792,462.

Grossner, Horst: *See—*
Burckhardt, Manfred H.; Krohn, Hellmut; Grossner, Horst; and Florus, Hans-Jorg, 3,791,702.

Groves, Richard B. Unloading arrangement for existing corn cribs. 3,791,085, Cl. 52-197.000.

Gruber, Wolfgang: *See—*
Thum, Waldemar; Wahlefeind, August Wilhelm; Naher, Gotthilf; Gruber, Wolfgang; Mollering, Hans; Weimann, Gunter; and Bergmeyer, Hans Ulrich, 3,791,931.

Grundell, Carl Erik. File. 3,791,747, Cl. 402-8.000.

Grune, Horst, to Varta Aktiengesellschaft. Process for reactivating a fuel cell battery. 3,791,870, Cl. 136-86.00e.

Gruzin, Pavel Lukich: *See—*
Afanasiev, Vadim Nikolaevich; Gaiduchik, Vladimir Olegovich; and Gruzin, Pavel Lukich, 3,792,252.

Gryctko, Carl E., to I-T-E Imperial Corporation. Anti blow-off means for circuit breaker contacts. 3,792,216, Cl. 200-146.00r.

GTE Laboratories, Incorporated: *See—*
Deitch, Richard, 3,791,887.
Klein, Richard M., 3,791,955.

GTE Sylvania Incorporated: *See—*
Arrington, William Lee; and Merz, Lee Irving, 3,792,387.
Benda, David; and Kerstetter, Donald R., 3,792,300.
Kaelin, Oscar J., 3,792,284.

Guainazzi, Mauro: *See—*
Ercoli, Raffaele; Guainazzi, Mauro; and Silvestri, Giuseppe, 3,791,944.

Guarino, Henry R., to United States of America, Health, Education and Welfare. Programmer for segmented balloon pump. 3,791,374, Cl. 127-1.00d.

Guarjado, Ciro, to Teledyne, Inc. Method of manufacturing an electronic assembly. 3,791,025, Cl. 29-577.000.

Guell, Jose Maria Dalmau, to Jumberca, S.A. Patterning mechanism for circular knitting machines. 3,791,174, Cl. 66-50.00r.

Guenther, Alfhart, to Siemens Aktiengesellschaft. Filter for electrical oscillations. 3,792,382, Cl. 333-72.000.

Gulf Research & Development Company: *See—*
Gustavson, Carl A.; Shutes, Emmett B.; and Wuenschel, Paul C., 3,791,612.

Gundlach, Robert W. Thermographic recording using vaporizable material and colored particle development. 3,792,266, Cl. 250-318.000.

Gunnar, Kurt Arne, to Aktiebolaget Iro. Thread supply device for textile machines. 3,791,599, Cl. 242-47.120.

Gustavson, Carl A.; Shutes, Emmett B.; and Wuenschel, Paul C., to Gulf Research & Development Company. Device for gripping and imparting slack in a cable. 3,791,612, Cl. 248-49.000.

Gustavsson, Eric Borje, to AB Asea-Atom. Off-gas system for nuclear reactors. 3,791,107, Cl. 55-179.000.

Gustavsson, Karl Axel G., to AB Bahco Ventilation. Gas cleaning apparatus. 3,791,109, Cl. 55-229.000.

Gustine, Floyd L.: *See—*
Diamond, Harold G.; and Gustine, Floyd L., 3,791,341.

Guttman, Murray. Model auto-giro. 3,791,067, Cl. 46-75.000.

Guyot, Joel, to Thomson-CSF. System for processing electrical signals including means for effectively increasing its length of a delay line. 3,792,344, Cl. 324-77.00d.

Guziak, Leonard F.: *See—*
Gleason, Edward H.; and Guziak, Leonard F., 3,792,007.

Gwnia, Ewald: *See—*
Ziemek, Gerhard; Beck, August; Gwnia, Ewald; Schatz, Friedrich; and Arntz, Hans-Joachim, 3,791,416.

Hack, Helmuth: *See—*
Klauke, Erich; Kuhle, Engelbert; Hack, Helmuth; and Eue, Ludwig, 3,792,089.

Hackett, William Harold, Jr.: *See—*
Dixon, Richard Wayne; Hackett, William Harold, Jr.; and McGahan, Thomas Edward, 3,791,948.

Hackstock, Fred W.: *See—*
Graham, James T.; and Hackstock, Fred W., 3,791,010.

Haddad, Raymond E. Stay cleaning device having a rollable sponge. 3,791,330, Cl. 114-221.000.

Haeusser, Harry C.; and Smith, Barry L., to UMC Industries, Inc. Coin apparatus. 3,791,503, Cl. 194-1.00g.

Hagell, Ronald A., to Du Pont de Nemours, E. I., and Company. Process of producing random three-dimensional crimped acrylic fibers. 3,790,997, Cl. 28-72.110.

Hagemann, Hermann: *See—*
Pedain, Josef; Arlt, Dieter; and Hagemann, Hermann, 3,792,004.

Hagyard, Cedric Jacques: *See—*
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Hagyard, Robert Thomas: *See—*
Hagyard, Thomas, 3,792,229.

Hagyard, Thomas; deceased (by Hagyard, Robert Thomas; and Hagyard, Cedric Jacques; executors). Apparatus for electrolytic heating of liquids. 3,792,229, Cl. 219-284.000.

Hahn, Maneung: *See—*
Duddey, James E.; Hahn, Maneung; and Schirmer, Joseph P., Jr., 3,792,015.

Haley, Floyd C., to California Institute of Technology. Gas analysis systems and palladium tube separator therefor. 3,791,106, Cl. 55-158.000.

Halkias, Nicholas, to Mobil Oil Corporation. Biodegradable lubricants. 3,791,975, Cl. 252-49.500.

Hall, Roger Smith, to Baker Perkins Jaxons, Limited. Sheet straightening and tensioning apparatus. 3,791,057, Cl. 38-143.000.

Hall, Wilbur S.: *See—*
Steinbrecher, Lester; and Hall, Wilbur S., 3,791,431.

Hallerback, Stig Lennart, to SKF Industrial Trading and Development Company, N.V. Stator for electric motors. 3,792,299, Cl. 310-258.000.

Halliburton Company: *See—*
Stephenson, Jack G., 3,791,534.

Hamada, Nagaharu; Miyanaka, Motosi; and Yasuda, Isao, to Hitachi, Ltd. Graphic display device. 3,792,464, Cl. 340-324.0ad.

Hamamoto, Takashi: *See*—
Fujiyama, Tetsuo; and Hamamoto, Takashi, 3,791,781.

Hamilton, Brian K., to Allied Chemical Corporation. Cone aspirating structure for air cushion inflation. 3,791,669, Cl. 280-150.0ab.

Hamilton, Joel A.: *See*—
Mahaffy, Reid A.; and Hamilton, Joel A., 3,792,181.

Hamman, Lyle J., to Eaton Stamping Company. Electric starter motor. 3,791,684, Cl. 290-38.000.

Hamman, Lyle J., to Eaton Stamping Company. Starter pinion with molded base and drive. 3,791,685, Cl. 290-38.000.

Hamman, Lyle J., to Eaton Stamping Company. Electric motor bursh card. 3,792,298, Cl. 310-242.000.

Hammelmann, Paul. Apparatus for cleaning vessels having an inlet. 3,791,394, Cl. 134-167.00r.

Hammer, Frank E., to Searle, G. D., & Co. Phosphatase assay using lyophilized aryl phosphate monoesters. 3,791,929, Cl. 195-103.50r.

Hammer, Klaus-Dieter; and Porrmann, Herbert, to Kalle Aktiengesellschaft. Process for the manufacture of a chemically bonded textile sheet material based on synthetic fibers and having a high water vapor absorption capacity. 3,791,849, Cl. 117-63.000.

Hammond, Aubrey J.; and Lubowitz, Hyman R., to United States of America, Navy, mesne. Castable polyurethane composite propellants. 3,791,892, Cl. 149-19.400.

Hand, John James: *See*—
Spicer, Larry Dean; and Hand, John James, 3,792,166.

Hanke, David E.; and Tews, Richard R., to Kimberly-Clark Corporation. Method for coating tampons with water-soluble film. 3,791,902, Cl. 156-212.000.

Hann, George W.: *See*—
Stout, Beaufort F.; and Hann, George W., 3,791,217.

Hanneman, Thomas W.: *See*—
O'Dea, Orrin B.; and Hanneman, Thomas W., 3,792,210.

Hansen, David E., to Eastman Kodak Company. Anatomical camera design. 3,791,274, Cl. 95-11.00r.

Hansen, Gunnar Lyshoji, to Danfoss A/S. Liquid pump, particularly a fuel-oil pump. 3,791,765, Cl. 417-357.000.

Hansen, Hans Christian: *See*—
Holt, Jurgen; and Hansen, Hans Christian, 3,791,279.

Hansen, John E.: *See*—
Coombes, William A.; Zavada, Richard A.; Hansen, John E.; Singleton, William A.; and King, Robert R., 3,792,067.

Hansen, Norbert Ernst Fritz; and Littmann, Walter Fritz Konrad, to U.S. Philips Corporation. Method of manufacturing a layer consisting of non-conducting pulverulent materials on curved surfaces. 3,791,951, Cl. 204-181.000.

Hanser, Paul Edmund, to Deere & Company. Power transmission device for rotating a grader circle. 3,791,264, Cl. 91-176.000.

Hanser, Paul Edmund; and Gebauer, Thomas Edward, to Deere & Company. Universal connection for blade-supporting draft frame of a motor grader. 3,791,457, Cl. 172-781.000.

Hansl, Nikolaus R., to Pacific Research Laboratories. Process for hydrolyzing 3-trifluoromethyl phenethylamines. 3,792,048, Cl. 260-247.20r.

Hanson, Alden B.; and Hanson, Chris A., to Hanson Industries Inc. Cable closure assembly. 3,790,991, Cl. 24-70.0sk.

Hanson, Charles C.; and Lemke, Lyle T., to International Business Machines Corporation. Partition system for image displays. 3,792,198, Cl. 178-7.910.

Hanson, Chris A.: *See*—
Hanson, Alden B.; and Hanson, Chris A., 3,790,991.

Hanson, Donald O., to Phillips Petroleum Company. Apparatus and process for producing methyl mercaptan. 3,792,094, Cl. 260-609.00r.

Hanson, Goodwin F. Pocket size manual adding machine. 3,792,242, Cl. 235-117.00a.

Hanson Industries Inc.: *See*—
Hanson, Alden B.; and Hanson, Chris A., 3,790,991.

Hanson, Lloyd A.: *See*—
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Hanson, Walter J., to Pitney-Bowes, Inc. Currency dispenser. 3,791,392, Cl. 133-1.00r.

Harada, Toshiaki: *See*—
Shimada, Keizo; Nishikawa, Takeo; Harada, Toshiaki; and Nagahama, Shizuo, 3,792,097.

Hardin, William Medford, to Champion International Corporation. Expandable chuck or mandrel. 3,791,659, Cl. 279-2.000.

Hare, Goerge H.: *See*—
Bogar, Joseph E.; Bragg, John K.; and Hare, Goerge H., 3,792,450.

Harker, William Edmund. Method of casting. 3,791,063, Cl. 43-4.500.

Harlan, James T., Jr., to Shell Oil Company. Low molecular weight block copolymers and coating compositions thereof. 3,792,005, Cl. 260-27.0bb.

Harper, Norman G.: *See*—
Spransy, Brower C.; Harper, Norman G.; and Steele, Joseph Clayton, 3,790,984.

Harrell, John W.; and Sexton, James H., to Mobil Oil Corporation. Method and apparatus for controlling the downhole acoustic transmitter of a logging-while-drilling system. 3,792,428, Cl. 340-18.0nc.

Harris, Rano J., Sr., to Precision Sampling Corporation. Seals (PSC-14). 3,791,560, Cl. 222-386.000.

Harris, Robert E.; and Moseley, William R., to Mobil Oil Corporation. Dewaxing and deoiling apparatus. 3,791,525, Cl. 210-217.000.

Harrison, Ian T.: *See*—
Fried, John H.; and Harrison, Ian T., 3,792,167.

Harrison, John M. Mobile platform carrying machine. 3,791,484, Cl. 182-2.000.

Hart, Arthur Clifford, Jr.: *See*—
Goehring, Clifford Clayton; Hart, Arthur Clifford, Jr.; and Wooldridge, Derek, 3,791,915.

Harte, Richard A.; Amstutz, Edwin A.; Bigliardi, Achille M., III; and Johnson, William M., to Omicron Systems Corporation. Breath test device for organic components, including alcohol. 3,792,272, Cl. 250-343.000.

Hartenstein, Johannes Hermann; Satzinger, Gerhard; and Herrmann, Manfred Franz, to Warner-Lambert Company. Cardio-active cardenolide rhamnosides. 3,792,038, Cl. 260-210.500.

Hartgerink, Ronald L.: *See*—
Baird, William C., Jr.; Surridge, John H.; and Hartgerink, Ronald L., 3,792,069.

Hartigan, Edward G., to Kendall Company, The, mesne. Vented operating room gown. 3,790,964, Cl. 2-114.000.

Harting, Stephen W., to Computer Transmission Corporation. Input circuit for optical signal receiver. 3,792,256, Cl. 250-199.000.

Hartz, Billy J. Mass transit system. 3,791,308, Cl. 104-139.000.

Hasbro Industries, Inc., mesne: *See*—
Wiser, Verlon E.; and McCallie, Charles W., 3,791,504.

Hashiguchi, Takeshi: *See*—
Sonoda, Takeshi; Hashiguchi, Takeshi; and Sato, Masaki, 3,792,100.

Hashimoto, Akira: *See*—
Tomiyama, Shunsuke; Hashimoto, Akira; and Yamamoto, Manabu, 3,792,371.

Hashimoto, Hiroshi; and Takashima, Susumu, to Nihon Denshi Kabushiki Kaisha. Scanning electron microscope with means to remove low energy electrons from the primary electron beam. 3,792,263, Cl. 250-311.000.

Hashimura, Takashi; Nikaido, Akira; Koyama, Isao; Wakabayashi, Hisao; and Ohuyl, Hideki, to Citizen Watch Company Limited. Crystal oscillator type small timepiece. 3,791,133, Cl. 58-23.0ac.

Hatano, Shogo: *See*—
Inoue, Giichi; Kubo, Naoshi; and Hatano, Shogo, 3,791,153.

Hathorn, George Stuart; and Cunningham, Victor Ralph, to Porvair Limited. Water vapour permeable flexible sheet materials. 3,791,997, Cl. 260-2.5ay.

Hatsopoulos, George N.; Lazaridis, Lazaros J.; and Searight, Edward F., to Thermo Electron Corporation. Heat pipe cooking appliance. 3,791,372, Cl. 126-390.000.

Hatsugai, Akitomi; and Ishida, Kazuyuki, to Mitsubadenkiseisakusho Co., Ltd. Wiper intermittently operating device. 3,792,405, Cl. 337-140.000.

Hattori, Saburo; and Tatsuoka, Kengo, to Mitsubishi Chemical Industries, Ltd. Process for producing reaction product of 1,3-conjugated diene compound and compound having terminal vinyl group and catalyst used therefor. 3,792,101, Cl. 260-677.00r.

Hauni-Werke Korber & Co., KG: *See*—
Kaeding, Heinz; Fick, Heinz; and Dahlgruen, Rolf, 3,791,507.

Hausberg, Gerhard; and Hegemann, Karl-Rudolf, to Gottfried Bischoff Bau Kompl. Gasreinigungs und Wasseruckkuhlanlagen KG. Flow-accelerating nozzle for gas scrubber. 3,791,108, Cl. 55-226.000.

Havenith, Lothar; Liebsch, Dietrich; and Zirner, Joachim, to Bayer Aktiengesellschaft. Process for the production of storage-stable polyurethane isocyanates. 3,792,023, Cl. 260-77.5aq.

Havens, Richard C.; and Taylor, James W., to Motorola, Inc. Wideband mechanically and electronically tuned negative resistance oscillator. 3,792,374, Cl. 331-107.00r.

Haviland, Harold R. Retractable vehicle passenger cushioning system. 3,791,667, Cl. 280-150.0ab.

Hawkins, Francis, to Newport Instruments Limited. Checking and calibration of apparatus incorporating a resonant circuit. 3,792,345, Cl. 324-.50r.

Hawley, Jack S. Oil well tool for measuring percent oil. 3,792,347, Cl. 324-30.00r.

Hawthorne, Vadghn T., to Keystone Industries, Inc. Mounting arrangement for the cushioning unit return spring assembly of an end-of-car railway cushioning device. 3,791,531, Cl. 213-8.000.

Hayashi, Yoshimasa, to Nissan Motor Company, Limited. Secondary air regulating system for automotive internal combustion engine. 3,791,146, Cl. 60-289.000.

Hayatdavoudi, Asadollah, to Petroleum Associates of Lafayette, Inc. Fluid control. 3,791,621, Cl. 251-122.000.

Hayes, George A., to United States of America, Navy. Annealing treatment for controlling warhead fragmentation size distribution. 3,791,881, Cl. 148-143.000.

Hayes, Gerald L., to Allis-Chalmers Corporation. Thrust adjusting mechanism for hydraulic turbine wicket gates. 3,791,761, Cl. 415-163.000.

Hayes, Thomas Edward; and Bechtel, Jon Harold, to Johnson Service Company. Temperature responsive actuator. 3,792,400, Cl. 337-38.000.

Hayes, William H., to Alton Box Board Company. Handling perishable product. 3,791,552, Cl. 205-501.000.

Haynes, Lincoln W. Apparatus for simulating barn wood. 3,791,427, Cl. 144-2.00r.

Hayre, Harbhajan S. Fluid pollution monitoring apparatus and method. 3,791,200, Cl. 73-67.100.

Hazan, Jean-Pierre: *See*—
Donjon, Jacques; Hazan, Jean-Pierre; and Marie, Gerard Joseph Marcel, 3,792,259.

Healy, Robert M.; and Hovey, Ralph J. Method and apparatus for fabricating selectively plated electrical contacts. 3,791,938, Cl. 204-15.000.
Hearin Forest Industries: *See*—
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Heberlein & Co., AG: *See*—
Hess, Leodegar, 3,791,120.
Raschle, Josef, 3,791,122.
Hechenbleikner, Ingenuin, to Weston Chemical Corporation. Continuous process of producing non-aromatic tin halides the organic group having not more than five carbon atoms. 3,792,059, Cl. 260-429.700.
Hechtfischer, Gustav: *See*—
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Hechtl, Wolfgang: *See*—
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Hedberg, Frederick L.: *See*—
Arnold, Fred E.; Hedberg, Frederick L.; and Kovar, Robert F., 3,792,017.
Hedges, Harry O. Fuel injection nozzle assembly. 3,791,591, Cl. 239-533.000.
Hegemann, Karl-Rudolf: *See*—
Hausberg, Gerhard; and Hegemann, Karl-Rudolf, 3,791,108.
Hegenscheidt, Wilhelm, Kommanditgesellschaft: *See*—
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Heinanen, Kauko: *See*—
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Heinard, Whilden G.: *See*—
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Heissmann, Willi: *See*—
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Heitzinger, Friedrich Franz Xaver, to Schwarzkopf Development Corporation. Extrusion die. 3,791,799, Cl. 29-182.500.
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Hill, William E., to United States of America, Army, mesne. Fast burning double-base propellant. 3,791,893, Cl. 149-19.000.
Hill, William Frank, to Lucas, Joseph, (Electrical) Limited. Liquid level detection systems. 3,792,456, Cl. 340-244.00r.
Hiller, Heinrich; and Jentzsch, Wolfgang, to Badische Anilin- und Soda-Fabrik Aktiengesellschaft. Production of anthraquinone-alpha-sulfonic acids. 3,792,065, Cl. 260-370.000.
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Itoh, Mitsuto, to Olympus Optical Co., Ltd. Forceps. 3,791,387, Cl. 128-320.000.
Itzuka, Oshi: *See—*
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Jackson, Charles R., Jr.; and Summerfield, Dallas G., to United States of America, National Aeronautics and Space Administration. Wind tunnel model and method. 3,791,207, Cl. 73-147.000.
Jackson, Wilbur C.; and Beck, William P., to Sunbeam Corporation. Electric dry shaver with inclined shaving head. 3,791,030, Cl. 30-43.900.
Jaeckle, Wilfried G.: *See—*
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Jaeger, Hannes: *See—*
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Jaffe, Joseph: *See—*
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Jaffe, Joseph, to Chevron Research Company. Hydrothermal method for manufacturing a novel catalytic material, catalysts containing said material, and processes using said catalysts. 3,791,963, Cl. 208-111.000.
Jaffe, Joseph, to Chevron Research Company. Hydrodesulfurization with a porous xerogel catalyst containing hydrogenating components and metal phosphate dispersion. 3,791,967, Cl. 208-216.000.
Jager, Ramund: *See—*
Wenzel, Werner; Franke, Friedrich Hermann; and Jager, Ramund, 3,791,994.
Jakob, Hans, to American Safety Equipment Corporation. Push button buckle. 3,790,994, Cl. 24-230.00a.
Janu, George J., to Johnson Service Company. Diaphragm pressure sensor. 3,791,397, Cl. 137-82.000.
Japan Gasoline Co., Ltd.: *See—*
Kusano, Kazuto; and Miyata, Kenji, 3,791,103.
Jelinek, Hugo G. Frame for processing photographic cut sheet film. 3,792,489, Cl. 354-344.000.
Jen, Dixon T.: *See—*
Casey, Richard C.; Duggan, Robert J.; Grosky, Stephen A.; Jen, Dixon T.; and Serra, John J., 3,792,462.
Jenkin, Arthur S., to Komline-Sanderson Engineering Corporation. Traction applying tool. 3,791,012, Cl. 29-254.000.
Jenkins, Robert L. Electric plug with both removable and pivotable ground pins. 3,792,411, Cl. 339-14.00p.
Jenkinson, John, to United Kingdom of Great Britain and Northern Ireland, Minister of Northern Ireland, Secretary of State for Defense in Her Britannic Majesty's Government of the. Cooling of turbine blades. 3,791,758, Cl. 415-116.000.
Jenoptik Jena G.m.b.H.: *See—*
Grey, Udo; and Klimmer, Winfried, 3,791,742.
Jensen, Norman P.; Shen, Tsung-Ying; and Windholz, Thomas B., to Merck & Co., Inc. Substituted indenoimidozoles. 3,792,057, Cl. 260-309.000.
Jentzsch, Wolfgang: *See—*

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Jepson, John W.: *See—*
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Jin, Jung Il: *See—*
Goswami, Jagadish C.; and Jin, Jung Il, 3,792,113.
Johansson, Axel Bernhard. Spectrometer in which a desired number of spectral lines are focused at one fixed output slit. 3,791,737, Cl. 356-79.000.
Johansson, Hans Arne Valentin. Lifting and transporting device for disabled persons. 3,790,974, Cl. 5-86.000.
John, Harald: *See—*
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Johnson & Johnson: *See—*
Krzewinski, Henrietta K., 3,791,381.
Johnson, Allan S., to Tapmatic Corporation. Tapping spindle with torque release clutch built into its shank and having automatic depth control. 3,791,756, Cl. 408-139.000.
Johnson, Anderson Forbes, Jr.: *See—*
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Johnson, Charles Wayne: *See—*
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Johnson, Everett M.; Vermillion, Herbert E.; and Wetmiller, Robert S., to Texaco Inc. Service station gasoline vapor recovery system. 3,791,422, Cl. 141-11.000.
Johnson, Floyd C.: *See—*
Long, George E.; Johnson, Floyd C.; and Reese, Dennis L., 3,791,452.
Johnson Products, Inc.: *See—*
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Johnson, Robert H.: *See—*
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Johnson Service Company: *See—*
Donovan, John C.; Klein, Carl F.; Korta, Lawrence B.; and Krishnaiyer, Ramesh, 3,792,470.
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Janu, George J., 3,791,397.
McLean, Michael B.; Krishnaiyer, Ramesh; and Rasmussen, Allen, 3,792,469.
Johnson, Wayne F., to United States of America, Atomic Energy Commission. Miniature multistation photometer rotor temperature control. 3,792,231, Cl. 219-497.000.
Johnson, William M.: *See—*
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Johnston, Walter K.; and Seaman, Gary G., to Western Electric Company, Incorporated. Heating method and apparatus for securing a member to an article. 3,791,018, Cl. 29-471.100.
Jonassen, Gaylord D., to Telecommunications Industries, Inc. Method of fabricating a three-terminal voltage surge arrester. 3,791,711, Cl. 316-20.000.
Jones & Laughlin Steel Corporation: *See—*
Loutzenhiser, Russell H.; Aukrust, Egil; and Meyer, Harry W., 3,791,819.
Jones, Alan Richardson, to Coulter Chemistry, Inc., mesne. Magnetic hopper system for loading and unloading a conveyor. 3,791,509, Cl. 198-41.000.
Jones, Charles: *See—*
Woodier, George T.; Jones, Charles; and Hermes, Walter L., 3,791,235.
Jones, John L.; and Rubino, Andrew M., to Armour Pharmaceutical Company. Basic aluminum bromide-polyol complexes and methods of making same. 3,792,070, Cl. 260-448.00r.
Jones, R. A., and Company, Incorporated: *See—*
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Jones, Robert J., to TRW Inc. Perfluoro addition polymers. 3,792,022, Cl. 260-77.5am.
Jorne, Jacob: *See—*
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Jornod, Eugene R., to Barber-Colman Company. Method and apparatus providng independent adjustments and compensations in condition sensitive measuring or controlling circuits. 3,792,366, Cl. 330-22.000.
Josef, Dieter; Lampart, Alfred; and Schwartz, Pirmin, to Hoffmann-La Roche Inc. Diagnostic test for glucose. 3,791,988, Cl. 252-408.000.
Jovil Manufacturing Co., Inc.: *See—*
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Joyce, John F.; and McIntire, Hoy O., to National Standard Company, mesne. Metal bonding with sintering. 3,791,798, Cl. 29-182.200.
Jubb, Albert; and Williams, David Eyre, to United Kingdom of Great Britain and Northern Ireland, Secretary of State for Defense in Her Britannic Majesty's Government of the. Fluidized bed powerplant with helium circuit, on direct heat exchange and compressd air bypass control. 3,791,137, Cl. 60-39.18r.
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Jullien, Marie-Jacques: *See—*
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Kadono, Tetsuro: *See—*
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Kaeding, Heinz; Fick, Heinz; and Dahlgruen, Rolf, to Hauni-Werke Korber & Co., KG. Apparatus for manipulating filter rod sections of multiple unit length. 3,791,507, Cl. 198-32.000.
Kaelin, Bette M.: *See—*
Glass, Marvin I.; Morrison, Howard J.; and Kaelin, Bette M., 3,791,662.
Kaelin, Oscar J., to GTE Sylvania Incorporated. Electro-optic transmission link. 3,792,284, Cl. 250-551.000.
Kagata, Tooru: *See—*
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Kaifu, Rokuro; Ochi, Kiyoshige; Nagashima, Renpei; and Hinohara, Yoshikazu, to Chugai Seiyaku Kabushiki Kaisha. Novel glucuronic acid derivatives and process for the preparation thereof. 3,792,064, Cl. 260-345.700.
Kailus, William A., to Bunker-Ramo Corporation. Electrical connector. 3,792,418, Cl. 339-177.00r.
Kaiser Aluminum & Chemical Corporation: *See—*
Israel, Robert D., 3,791,816.
Kajita, Takeshi: *See—*
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Kakumu, Ichizo; and Ito, Teruyuki, to Toyoda Koki Kabushiki Kaisha. Grinding machine with wheel dress compensating apparatus. 3,791,084, Cl. 51-165.870.
Kalle Aktiengesellschaft: *See—*
Hammer, Klaus-Dieter; and Porrmann, Herbert, 3,791,849.
Marx, Gerhard, 3,792,312.
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, to Societe Anonyme dite: L'Oreal. p-Hydroxy-diphenylamine compounds. 3,792,090, Cl. 260-571.000.
Kamada, Hidemoto: *See—*
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Kamimura, Sinya. Inner sole. 3,791,051, Cl. 36-44.000.
Kaminaka, Hiroshi; Kotera, Norio; Kuruma, Hiroshi; and Yanagihara, Hideki, to Sumitomo Chemical Company, Ltd. Carbonate esters of aromatic hydroxy carboxylic acids. 3,792,075, Cl. 260-463.000.
Kammerer, Archer W., Jr.: *See—*
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Kanda, Katsumi: *See—*
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Kane, Richard E.; and Reese, Frank L.; deceased (by Reese, Blanche C.; executrix), to Westinghouse Electric Corporation. High-voltage circuit interrupter incorporating series vacuum interrupter elements. 3,792,213, Cl. 200-144.00b.
Kaneno, Masayuki: *See—*
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Kanner, Bernard: *See—*
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Kaplan, Earl, to American Cyanamid Company. Vulcanization accelrator for natural and synthetic rubber. 3,791,838, Cl. 106-205.000.
Kappeler, Heini: *See—*
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Karandy, Fred: *See—*
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Burmistrova, Tamara Petrovna; Bardina, Tatyana Alexandrovna; Galpern, Grigary Davidovich; Karaulova, Elena Nikolaevna; Luchai, Nonna Alexandrovna; Terpilovsky, Nikolai Nikolaevich; and Khitrik, Adolf Alexandrovich, 3,792,095.
Kartinen, Ernest J.; and Lewis, Roger W., said Lewis assor. to Garrett Corporation, The and said Kartinen assor. to Signal Oil and Gas Company. Centrifugal separator discharge control system. 3,791,575, Cl. 233-19.00a.

Kastan, Howard; and Pena, Joe C., to Lockheed Aircraft Corporation. Retention member. 3,791,234, Cl. 74-579.00r.
Katagiri, Kiyoshi: *See—*
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Katagiri, Toshio; Suga, Tokuji; Omiya, Shoji; and Matsuda, Isamu, to Matsushita Electric Industrial Co., Ltd. Stepping motor controlled in response to data from a tape. 3,792,335, Cl. 318-685.000.
Katakabe, Noboru, to Matsushita Electric Industrial Co., Ltd. Fixing apparatus. 3,792,488, Cl. 354-300.000.
Katusha, Jerome M. Powder dispensing apparatus having a predictable controlled flow rate. 3,791,558, Cl. 222-161.000.
Kauffman, Robert N.: *See—*
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Kaufman, Rudolph; and Thouret, Wolfgang E., to Duro-Test Corporation. Method of making a lamp with oscillating filament. 3,790,998, Cl. 29-25.130.
Kaufmann, Siegfried; and Rutz, Hans, to Rieter Maschine Works, Ltd. Method and apparatus for controlling the doffing of bobbins and the donning of tubes on spindles of ring spinning and ring twisting machines. 3,791,124, Cl. 57-52.000.
Kawabata, Hidetsogu: *See—*
Yamashita, Tadaoki; Yamamoto, Osamu; Oonishi, Hajimo; Kawabata, Hidetsogu; and Kitamura, Saburo, 3,792,277.
Kawaguchi, Hiroshi; Konishi, Masataka; and Tsukiura, Hiroshi, to Bristol Myers Company. Process for preparing ambutyrosin. 3,792,037, Cl. 260-210.00r.
Kawakami, Hajipe, to Nippon Keori Co., Ltd. Spinning machine yarn package tube exchanging device. 3,791,125, Cl. 57-52.000.
Kawamura, Hiroyuki: *See—*
Mita, Ikuo; Kawamura, Hiroyuki; and Manaka, Shiro, 3,791,943.
Kawamura, Saburo; Ozaki, Taiji; and Orii, Saburo, to Kuraray Co., Ltd. Method of preparing films of polyvinyl alcohol resins. 3,792,146, Cl. 264-205.000.
Kawasaki, Harumi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Interferometer for X-Y measurement. 3,791,739, Cl. 356-106.00r.
Kawasaki, Jiro: *See—*
Narusawa, Shozo; Itzuka, Oshi; and Kawasaki, Jiro, 3,791,545.
Kawauchi, Yoshikazu, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Method and apparatus for replacing bobbins on spinning or twisting machines. 3,791,123, Cl. 57-52.000.
Kawecki Berylco Industries, Inc.: *See—*
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Kay Manufacturing Corporation: *See—*
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Kaye, Morton; and Radlauer, Marvin I., to Radlauer, Marvin I. Portable microfilm viewer. 3,791,728, Cl. 353-26.000.
Kazan, Benjamin, to International Business Machines Corporation. Ferroelectric ceramic storage display tube. 3,792,449, Cl. 340-173.200.
Kazem, Abdollah. Solid state circuit breaker. 3,792,289, Cl. 307-125.000.
Kazutaka, Mayima: *See—*
Isono, Masao; Tomoda, Katsumi; Miyata, Koichi; Kazutaka, Mayima; and Kodama, Reijiro, 3,792,160.
Keane, Joseph. Quick-change faucet. 3,790,966, Cl. 4-192.000.
Keefe, George E.: *See—*
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Kehr, J. Alan: *See—*
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Keijzer, Johan H.; and Beets, Roland H. C., to Monroe Belgium N.V. Shock absorber with piston rod guide and seal means. 3,791,495, Cl. 188-322.000.
Keimpema, Keimpe Klaas; and Vonk, Klaas, to U.S. Philips Corporation. Vacuum cleaner fan assembly. 3,791,772, Cl. 417-423.00a.
Keir-McGee Chemical Corporation: *See—*
Maxwell, John Augustus; and Merrill, Michael Wallace, 3,792,150.
Keith, Arlie L. Digital clinical thermometer. 3,791,214, Cl. 73-362.0ar.
Keith, Carl D.; and Mooney, John J., to Engelhard Minerals & Chemicals Corporation. Process and apparatus. 3,791,143, Cl. 60-274.000.
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Keller, Joseph H., Jr., to Kidde, Walter, & Company, Inc. Boom angle indicator. 3,791,338, Cl. 116-124.00f.
Kelly, Richard A.: *See—*
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Kenney, John Thomas: *See—*
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Kent, William Harold, Jr.: *See—*
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Kessler, Peter-Jurgen, to Bosch, Robert, G.m.b.H. Wiper arrangement for windshields and the like. 3,790,985, Cl. 15-250.340.
Ketchpel, Paul A.: *See—*
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Keto, August I., to Westinghouse Electric Corporation. Electrical load-break apparatus. 3,792,215, Cl. 200-144.000.
Keyloun, Carol: *See—*
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Keys, Joe H. Tube pulling device. 3,791,011, Cl. 29-252.000.
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Khitrik, Adolf Alexandrovich: *See—*
Burmistrova, Tamara Petrovna; Bardina, Tatyana Alexandrovna; Galpern, Grigary Davidovich; Karaulova, Elena Nikolaevna; Luchai, Nonna Alexandrovna; Terpilovsky, Nikolai Nikolaevich; and Khitrik, Adolf Alexandrovich, 3,792,095.
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Kikutsugi, Aisaku; and Shimoyama, Yoshihisa, to Kabushiki Kaisha Tokyo Keiki (Tokyo Keiki Co., Ltd.). Hydraulic pressure generating device. 3,791,766, Cl. 417-363.000.
Kilbourn, Eugene L.; and Baker, James T., to Progressive Dynamics, Inc. Light fixture with removable lens. 3,792,250, Cl. 240-7.100.
Kim, Keun Y., to Monsanto Company. Stabilized phosphate and dentifrice compositions and process for producing same. 3,792,152, Cl. 423-311.000.
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Kingsbury, Keith M. Radar range lock loop. 3,792,471, Cl. 343-7.300.
Kingston Conveyors Limited: *See—*
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Kishikawa, Hiroshi; Yasuno, Kiyoshi; Kitamura, Shuji; Ueno, Katsuji; Inoue, Haruo; and Toyota, Nobuhiro, to Sumitomo Chemical Company, Ltd. Thermoplastic resin composition comprising polycarbonates and polyarylene esters. 3,792,115, Cl. 260-860.000.
Kishikawa, Hiroshi; Yasuno, Kiyoshi; Kitamura, Shuji; Ueno, Katsuji; Inoue, Haruo; and Toyota, Nobuhiro, to Sumitomo Chemical Company, Ltd. Resin composition comprising styrene resin and a polyarylene ester. 3,792,118, Cl. 260-873.000.
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Kitano, Shin; and Kagata, Tooru, to Aisin Seiki Kabushiki Kaisha. Differential. 3,791,237, Cl. 74-711.000.
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Klang, Daniel M.; and Mosciatti, Roger, to Bucode, Inc. Light collecting and transmitting apparatus. 3,791,607, Cl. 242-184.000.
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Klauke, Erich; Kuhle, Engelbert; Hack, Helmuth; and Eue, Ludwig, to Bayer Aktiengesellschaft. N-aryl ureas. 3,792,089, Cl. 260-553.00a.

Kleekamp, Robert L., to National Cash Register Company, The. Microform reader projection lens tracking mechanism. 3,791,727, Cl. 353-101.000.

Klein, Carl F.: *See—*
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Klein, Heinrich; Pieper, Rudolf; and Sieth, Joachim, to Siemens Aktiengesellschaft. Apparatus for producing granular solids from the gaseous phase such as by sublimation. 3,791,110, Cl. 55-261.000.

Klein, Leo J., to Emerson Electric Co. Electrical connections. 3,792,410, Cl. 338-296.000.

Klein, Richard M., to GTE Laboratories, Incorporated. Preparation of chaloogenide glass sputtering targets. 3,791,955, Cl. 204-298.000.

Kleitz, Michel: *See—*
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Knapp, Heinrich: *See—*
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Knappenberger, Thomas A., to Motorola, Inc. Hybrid strip transmission line circuitry and method of making same. 3,792,383, Cl. 333-84.00m.

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Muhling, Alois; Schmidt, Helmut; and Knie, Hans, 3,792,207.

Kniefel, Alfred Beryl. Building block. 3,791,090, Cl. 52-593.000.

Knudson, Gary A. Method and apparatus for forming multiple panel shapes. 3,791,185, Cl. 72-181.000.

Kobayashi, Hisashi; and Tang, Donald Tao-Nan, to International Business Machines Corporation. Receiver structure for equalization of partial-response coded data. 3,792,356, Cl. 325-42.000.

Kobayashi, Kazuo; and Kaneno, Masayuki, to NGK Insulators, Ltd. Utilizing mixtures of yttria, magnesia, and lanthanum oxide in manufacture of transparent alumina. 3,792,142, Cl. 264-65.000.

Kobori, Toshio; and Ohba, Masaru, to Minolta Camera Kabushiki Kaisha. Switching apparatus for electric shutter mechanisms. 3,791,277, Cl. 95-42.000.

Koch, James Allan; and Henderson, Donald Leroy, to Deere & Company. Multi-load tractor hitch system. 3,791,454, Cl. 172-7.000.

Koch, James Allan, to Deere & Company. Tractor hitch system including a vertically swingable drawer powered by a draft line actuator. 3,791,456, Cl. 172-450.000.

Kockums Mekaniska Verkstads AB: *See—*
Dahlquist, Nils Axel Viktor, 3,791,339.

Kodama, Reijiro: *See—*
Isono, Masao; Tomoda, Katsumi; Miyata, Koichi; Kazutaka, Mayima; and Kodama, Reijiro, 3,792,160.

Kodata, Inc.: *See—*
Macune, Charles W.; and Parrish, Walter J., 3,791,291.
Stout, Beauford F.; and Hann, George W., 3,791,217.

Koeda, Takemi: *See—*
Fukatsu, Shunzo; Ishikawa, Tetsuo; Miura, Taro; Niida, Taro; Noniya, Bunzo; and Koeda, Takemi, 3,792,035.

Koehler, Carlton L. Underwater wet cell battery case. 3,791,875, Cl. 136-173.000.

Koehring Company: *See—*
Mistarz, Robert J., 3,791,894.

Koeijmans, Gerard D., to Mobil Oil Corporation. Apparatus for controlling the transfer of data from core to disc storage in a video display system. 3,792,442, Cl. 340-172.500.

Kohler, Pius; and Kuhn, Falk, to Fouquet-Werk Franz & Planck. Detection device for errors in the angular position of a pattern control drum for a textile machine. 3,791,176, Cl. 66-138.000.

Kohlmannsperger, Josef, to Agfa-Gevaert Aktiengesellschaft. Thermomagnetic imaging method. 3,791,843, Cl. 117-17.500.

Koizumi, Ken; Ikeda, Yoshiro; and Yoshiyagawa, Mitsugi, to Nippon Selfoc Kabushiki Kaisha; a/k/a Nippon Selfoc Co., Ltd. Continuous production of light-conducting glass fibers with ion diffusion. 3,791,806, Cl. 65-3.000.

Kokusai Keiso Co., Ltd.: *See—*
Nagatani, Norimichi; and Imamura, Toyohide, 3,791,554.

Kollmar, Ulrich, to Gebr. Bellmer KG. Machine for flattening cartons. 3,791,268, Cl. 93-53.00r.

Kollmer, Werner: *See—*
Stengel, Max; Kollmer, Werner; and Grassl, Manfred, 3,792,189.

Kolodchin, William; and Brackenridge, David R., to Ethyl Corporation. Flame resistant polyester. 3,792,117, Cl. 260-864.000.

Komazaki, Tosio, to Action Films, Inc. Motion picture apparatus. 3,791,723, Cl. 352-72.000.

Komline-Sanderson Engineering Corporation: *See—*
Jenkin, Arthur S., 3,791,012.

Komroff, Paul: *See—*
Savitz, Rubin Seymour; and Komroff, Paul, 3,791,160.

Kondrot, Leonard B.: *See—*
Van Patten, Eric M.; O'Rell, Dale H.; and Kondrot, Leonard B., 3,792,176.

Konig, Johann: *See—*
Rushing, Heinrich; Duwel, Dieter; and Konig, Johann, 3,792,054.

Konishi, Masataka: *See—*
Kawaguchi, Hiroshi; Konishi, Masataka; and Tsukiura, Hiroshi, 3,792,037.

Konnemann, Alfred; and Muller, Wulf, to Fa. Grote & Hartmann. Electrical coupling element. 3,792,420, Cl. 339-258.00r.

Koppers Company, Inc.: *See—*
Gidick, Ward F., 3,791,320.
Wright, John, 3,791,169.

Korbert, Hermann: *See—*
Lange, Karl-Heinz; and Korbert, Hermann, 3,792,486.

Korpics, Charles J. Vapor phase inhibitor containing benzotriazole and tolyltriazole mixtures. 3,791,855, Cl. 117-154.000.

Korta, Lawrence B.: *See—*
Donovan, John C.; Klein, Carl F.; Korta, Lawrence B.; and Krishnaiyer, Ramesh, 3,792,470.

Kose, Tatsuo; Hori, Kiyokazu; and Ochi, Kazuo, to Daiwa Boseki Kabushiki Kaisha and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Automatic doffing apparatus. 3,791,126, Cl. 57-53.000.

Koshugi, Jyoniti: *See—*
Araki, Tadashi; Asano, Kiro; and Koshugi, Jyoniti, 3,791,847.

Koskimies, Jouni; and Heinanen, Kauko, to Valmet Oy. Headbox of a paper making machine having multiple, vertically inclined vanes. 3,791,918, Cl. 162-343.000.

Kotera, Norio: *See—*
Kaminaka, Hiroshi; Kotera, Norio; Kuruma, Hiroshi; and Yanagihara, Hideki, 3,792,075.

Kotick, Michael Paul: *See—*
Erickson, Robert Joseph; Kotick, Michael Paul; Reverman, Lawrence Francis; and Wilson, Dan P., 3,792,039.

Kotitschke, Josef: *See—*
Thumm, Helmut; Ruessmann, Gerd; and Kotitschke, Josef, 3,791,596.

Kovacs, Stephen G. Magnetic heart pump. 3,791,769, Cl. 417-417.000.

Kovar, Robert F.: *See—*
Arnold, Fred E.; Hedberg, Frederick L.; and Kovar, Robert F., 3,792,017.

Koyama, Isao: *See—*
Hashimura, Takashi; Nikaido, Akira; Koyama, Isao; Wakabayashi, Hisao; and Ohuyl, Hideki, 3,791,133.

Koyama, Kaoru: *See—*
Murotani, Masayoshi; Yano, Tsunetoshi; Koyama, Kaoru; and Motojima, Toshiharu, 3,792,380.

Krahn, Hans-Joachim: *See—*
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Krajewski, Ignacy: *See—*
Procter, Brian John; Osborne, Colin Sidney; and Krajewski, Ignacy, 3,792,285.

Krakauer, Daniel: *See—*
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Krakauer, Edwin G.: *See—*
Grille, Thomas; Krakauer, Daniel; and Krakauer, Edwin G., 3,791,749.

Krall, Heribert A.; and Maag, Helmut, to Technica-Guss GmbH. Strand milling machine. 3,791,258, Cl. 90-21.00c.

Kralstein, Sheldon D.: *See—*
Gilbreath, Dennis R.; and Kralstein, Sheldon D., 3,792,246.

Kramer, Daniel E. Pressure switch for refrigeration systems. 3,791,161, Cl. 62-226.000.

Kran, Hans-Peter: *See—*
Pfeiffer, Gerd; Kran, Hans-Peter; and Feldmann, Wilhelm, 3,791,184.

Krantz, H.: *See—*
Vernazza, Julius; and Marx, Oskar, 3,791,489.

Krasnick, Solomon: *See—*
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Kratzer, Bernd J. L.; and Ulffers, Heinz, to Zeiss-Stiftung, Carl; d/b/a Zeiss, Carl. Method of and device for determining the state of refraction of a human eye. 3,791,719, Cl. 351-11.000.

Kreifels, Clifford A., to Dale Electronics, Inc. Fuse resistor and the method for making same. 3,792,406, Cl. 337-163.000.

Kresge, Edward N.: *See—*
Strate, Gary Ver; and Kresge, Edward N., 3,791,913.

Kressman, Theodore Roger Ernest: *See—*
Roubinek, Lubor; and Kressman, Theodore Roger Ernest, 3,792,029.

Krieger, Bernhard; Bolze, Manfred; and Drawert, Manfred, to Schering AG. Hot melt pressure sensitive adhesives. 3,792,002, Cl. 260-18.00n.

Krishnaiyer, Ramesh: *See—*
Donovan, John C.; Klein, Carl F.; Korta, Lawrence B.; and Krishnaiyer, Ramesh, 3,792,470.
McLean, Michael B.; Krishnaiyer, Ramesh; and Rasmussen, Allen, 3,792,469.

Kroger, Paul W., to Aluminum Company of America. Method of making high strength aluminum alloy forgings and products produced thereby. 3,791,876, Cl. 148-2.000.

Krohn, Hellmut: *See—*
Burckhardt, Manfred H.; Krohn, Hellmut; Grossner, Horst; and Florus, Hans-Jorg, 3,791,702.

Kroll, Gert Wolfgang. Filter device. 3,791,111, Cl. 55-341.000.

Krueger, Friedrich; and Bauer, Lieselotte, to Benckiser, Joh. A., GmbH, Chemische Fabrik. Process of preventing scale and deposit formation in aqueous systems and composition. 3,791,978, Cl. 252-180.000.

Krueger, Keith Theophil, to I-T-E Imperial Corporation. Anti-singular pleating device. 3,792,222, Cl. 200-169.00r.

Krzewinski, Henrietta K., to Johnson & Johnson. Universal surgical drape. 3,791,381, Cl. 128-132.00d.

Kublick, Christian, to Siemens Aktiengesellschaft. Control device for an inverted converter. 3,792,339, Cl. 321-18.000.

Kubo, Naoshi: *See*—
Inoue, Giichi; Kubo, Naoshi; and Hatano, Shogo, 3,791,153.

Kuehl, Guenter H., to Mobil Oil Corporation. Hydrocarbon conversion process employing a crystalline aluminosilicate and method of preparing the same. 3,791,964, Cl. 208-120.000.

Kuhle, Engelbert: *See*—
Klauke, Erich; Kuhle, Engelbert; Hack, Helmuth; and Eue, Ludwig, 3,792,089.

Kuhn, Falk: *See*—
Kohler, Pius; and Kuhn, Falk, 3,791,176.

Kuhnlein, Hans, to Siemens Aktiengesellschaft. Spinning turbine having speed-controlled brakeable electric drive motor. 3,792,329, Cl. 318-210.000.

Kulik, Conrad J.: *See*—
Gorin, Everett; Kulik, Conrad J.; and Lebowitz, Howard E., 3,791,956.

Kunin, Robert; and Fries, William, to Rohm & Haas, Company. Recovery of waste brine regenerant. 3,791,866, Cl. 127-46.00a.

Kunze, Bernhard, to Hegenscheidt, Wilhelm, Kommanditgesellschaft. Method and apparatus for smooth-rolling of cylindrical workpiece surfaces. 3,791,000, Cl. 29-90.00r.

Kunze, Hans: *See*—
Boguth, Walter; Studer, Rolf; Achterrath, Ute; and Kunze, Hans, 3,792,034.

Kuraray Co., Ltd.: *See*—
Kawamura, Saburo; Ozaki, Taiji; and Orii, Saburo, 3,792,146.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Araki, Tadashi; Asano, Kiro; and Koshugi, Jyoniti, 3,791,847.
Murayama, Naohiro; and Okiawa, Takao, 3,792,204.

Kurimoto, Mikishi; Inagakt, Syoji; and Oda, Noriyasu, to Toyoda Koki Kabushiki Kaisha. Machine tool with automatic tool changing apparatus. 3,791,022, Cl. 29-568.000.

Kuruma, Hiroshi: *See*—
Kaminaka, Hiroshi; Kotera, Norio; Kuruma, Hiroshi; and Yanagihara, Hideki, 3,792,075.

Kusano, Kazuto; and Miyata, Kenji, to Japan Gasoline Co., Ltd. Method of treating waste gas arising from industrial facility. 3,791,103, Cl. 55-73.000.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Nakayama, Kiyoshi; and Araki, Kazumi, 3,791,925.

La Baw, Kenneth B.: *See*—
Gardner, Keith L.; and La Baw, Kenneth B., 3,792,257.

La Costa, Nicholas J., to AAI Corporation. Integral primer cartridge. 3,791,301, Cl. 102-45.000.

La Lena, George A.; and Stewart, Jack D., to Princeton Metal Systems Corporation. Collapsible feed mechanism. 3,791,186, Cl. 72-272.000.

Labrunie, Guy: *See*—
Borel, Joseph; Deutsch, Jean-Claude; Labrunie, Guy; and Robert, Jacques, 3,791,716.

Labuda, Edward Franklin; and Ryden, William Dennis, to Bell Telephone Laboratories, Incorporated. Method for neutralizing charge in semiconductor bodies and dielectric coatings induced by cathodic etching. 3,791,952, Cl. 204-192.000.

Lacey, Thomas G. Photographic apparatus. 3,792,264, Cl. 250-311.000.

Lacher, Jorge Halder. Centrifuge and rotating discharge means therefor. 3,791,577, Cl. 233-21.000.

Lacoste, Jean: *See*—
Dufrene, Jean-Louis; Lacoste, Jean; Schley, Robert; and Tortel, Jean, 3,791,026.

Lacy-Hulbert and Company, Limited: *See*—
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Lakeside Manufacturing Inc.: *See*—
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Laks, Maurice. Electrical regulating system. 3,792,317, Cl. 317-157.000.

Lamb, Louis John: *See*—
Hollingsworth, Clinton Allen; and Lamb, Louis John, 3,791,810.

Lambert, Andre: *See*—
Faugeras, Anne-Marie; and Lambert, Andre, 3,792,479.

Lammers, Sidney G., to Dart Industries, Inc. Process of moulding foamable materials by simultaneously heating and vibrating the mold. 3,792,138, Cl. 264-46.000.

Lamorte, Howard W.; and Pliakos, Kostas, to Hico Corporation of America. Apparatus for compacting material. 3,791,289, Cl. 100-179.000.

Lampart, Alfred: *See*—
Josef, Dieter; Lampart, Alfred; and Schwartz, Pirmin, 3,791,988.

Lampe, John G.; and Wall, Willie E., to Armstrong Cork Company. Method of making a thermoplastic drawer. 3,791,002, Cl. 29-155.00r.

Landis, Earle H.; and Bostick, Frank W., to Schick Incorporated. Hair dryer with one finger head release. 3,791,045, Cl. 34-99.000.

Landwehrkamp, Hans; and Niestroj, Heinrich, to Schubert & Salzer Maschinenfabrik Aktiengesellschaft. Method and apparatus for stopping and starting one or more open-end-spinning devices. 3,791,128, Cl. 57-93.000.

Lang, Robert J., to Esso Research and Engineering Company. Reactor assembly to reduce automotive emissions from an internal combustion engine. 3,791,144, Cl. 60-278.000.

Lange, Karl-Heinz; and Korbert, Hermann, to Blada-Werke. Camera-radio combination. 3,792,486, Cl. 354-76.000.

Lange, Winthrop E.: *See*—
Friedmann, Charles Aubrey; Hofer, Peter; and Lange, Winthrop E., 3,792,129.

Larson, Agne, to Nuclear-Chicago Corporation. Scintillation camera with improved resolution. 3,792,274, Cl. 250-368.000.

Lau, Raymond Thomas, to Owens-Illinois, Inc. Method of strengthening glass articles using powdered salts for ion exchange. 3,791,809, Cl. 65-30.000.

Lauchlan, Robert; and Shaw, Gray, to Uniroyal, Inc. Composition of polysulfones and polyurethanes. 3,792,114, Cl. 260-858.000.

Lauriente, Michael; and Pemsel, Ernst R., Jr., to Westinghouse Electric Corporation. Thermal coated booms for spacecraft. 3,791,853, Cl. 117-97.000.

Laverman, Royce Jay, to Chicago Bridge & Iron Company. Cryogenic storage tank facility with dike wall cooled by leaking liquefied gas. 3,791,164, Cl. 62-50.000.

Law, Russell R.: *See*—
Brewer, George R.; and Law, Russell R., 3,791,270.

Lawless, Glen D.; and Ullrich, Leonard E., to Hydroflow Supply Inc. Resilient flexible hose. 3,791,415, Cl. 138-127.000.

Lawrence, Allan Keith, to Deere & Company. Row crop harvester attachment. 3,791,117, Cl. 56-98.000.

Lawson, Gustaf Rudolph, to AMP Incorporated. Crimping tool. 3,791,189, Cl. 72-410.000.

Lazaridis, Lazaros J.: *See*—
Hatsopoulos, George N.; Lazaridis, Lazaros J.; and Searight, Edward F., 3,791,372.

Lazickas, Casimir M., to Eastman Machine Company. Machine for cutting-sheet-like material such as fabric. 3,791,246, Cl. 83-375.000.

Le Parquier, Guy; and Jullien, Marie-Jacques, to Thomson-CSF. Phase control circuit. 3,792,478, Cl. 343-100.0sa.

Le Rouax, Robert K., to Hydril Company. Non-rotating ram rod locking assembly for blowout preventer. 3,791,616, Cl. 251-1.000.

Le Van, Sally A. Method of cutting and decorating eggshells. 3,791,895, Cl. 156-62.000.

Lean, Eric G.; and Pennington, Keith S., to International Business Machines Corporation. System for coupling light from a fiber optic waveguide into a thin film waveguide. 3,791,715, Cl. 350-96.0wg.

Leblanc, G., Corporation: *See*—
Pascucci, Vito; and Stubbins, William H., 3,791,253.

LeBlanc, John R.: *See*—
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Lebowitz, Howard E.: *See*—
Gorin, Everett; Kulik, Conrad J.; and Lebowitz, Howard E., 3,791,956.

Lebra, Jacques, to U.S. Philips Corporation. Device for centering an X-ray film cassette. 3,792,283, Cl. 250-468.000.

Lebreton, Francisque; Sarda, Jean-Paul; and Morlier, Pierre, to Institut Francais du Petrole, des Carburants et Lubrifiants I & 4. Device for emitting and receiving signals in a bare hole, eliminating the influence on the intensity of the signals being recived of the shape of the hole and of a centering defect of the device in the latter. 3,791,479, Cl. 181-.5be.

LeCain, Paul R.: *See*—
Wymore, Charles E.; and LeCain, Paul R., 3,792,441.

Lecuyer, Daniel Marie Pierre, to Vigifeu Aubervillios. Ionization chamber in particular for a fire detection device. 3,792,254, Cl. 250-83.6ft.

Lee, Ernest O., Jr.: *See*—
Adams, John A., Jr.; Lee, Ernest O., Jr.; and Wichlajew, Karl, 3,792,202.

Lee, Raymond, Organization, Inc., The: *See*—
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Lee, Richard J.: *See*—
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Leeds & Northrup Company: *See*—
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Leemann, Walter, A.G. Fabrik fur fototechnische, elektronische und feinmechanische Apparate: *See*—
Mey, Hansjurc, 3,791,734.

Lefebvre, Pierre Albert, to G.M.T. S.A. Automotive structure for revolving stands. 3,792,296, Cl. 310-166.000.

Leftwich, Richard F.; and Ensor, Robert T., to Barnes Engineering Company. Infrared intrusion sensor. 3,792,275, Cl. 250-338.000.

Leger, Andre: *See*—
Fouche, Jean; and Leger, Andre, 3,792,042.

Lehmann, Walter, to Mirabed AG. Spring core mattress and method of making same. 3,790,972, Cl. 5-351.000.

Leimgruber, Willy; and Weigele, Manfred, to Hoffmann-La Roche Inc. Process for the preparation of 4-amino-2-methylpyridine 5-carboxamide. 3,792,076, Cl. 260-465.400.

Lemke, Lyle T.: *See*—
Hanson, Charles C.; and Lemke, Lyle T., 3,792,198.

Lenius, Gary L., to Kimberly-Clark Corporation. Method and apparatus for improved web transfer. 3,791,603, Cl. 242-56.00r.

Leon, Simons, to N & S Co. Turbine engine with valved, rotating combustion chamber. 3,791,139, Cl. 60-39.340.

Lepper, James M., Jr., to Wehr Corporation. Dilution system for particle analyzer. 3,791,196, Cl. 73-28.000.

Leslie Co.: *See*—
Muller, John T.; and Cooper, James H., 3,791,413.

Leslie, Donald M.: *See*—
Voot, Charles C.; Talcott, John W.; Leslie, Donald M.; Dovell, Clark W.; and Black, Samuel J., 3,791,296.

Levison, Melvin L. Variable reactance controls for AC powered heating magnetrans. 3,792,369, Cl. 331-71.000.

Levy, Alan J.: *See*—
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Levy, Arthur L.: *See*—
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Lewis, Edward A.; Rasmussen, John E.; and Stahmann, James R., to United States of America, Air Force. Single cycle transmitter. 3,792,358, Cl. 325-128.000.

Lewis, Jay L.: *See*—
Brakebill, Harold G.; Lewis, Jay L.; and Berleyoung, Walter J., 3,791,405.

Lewis, Richard Newton, to Stauffer Chemical Company. Silylating agent. 3,792,072, Cl. 260-448.20e.

Lewis, Robert E.; and Hanson, Lloyd A., to General Electric Company. Radioactive xenon solution. 3,791,982, Cl. 252-301.10r.

Lewis, Roger W.: *See*—
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Leyman Manufacturing Corporation: *See*—
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Lezius, Axel: *See*—
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Licitis, Gunars; and Rodmaker, Gerald M., to Glass, Marvin, Associates. Phonograph index means. 3,791,656, Cl. 274-17.000.

Liden, Thomas M.: *See*—
Brandenburg, John T.; Suggitt, Robert M.; and Liden, Thomas M., 3,792,098.

Lidstone, James E., to Donaldson Company, Inc. Moisture removing stack cap for engine air intakes. 3,791,112, Cl. 55-385.000.

Liebsch, Dietrich: *See*—
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Liedicke, Albert: *See*—
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Lietzke, Heinz, to Schiess Aktiengesellschaft. Lifting device for lifting and lowering heavy loads. 3,791,229, Cl. 74-128.000.

Lif-O-Gen, Inc.: *See*—
Strople, Gordon N.; and Mills, Junstin W., Jr., 3,791,424.

Limpens, Karl: *See*—
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Lin, Yeong S.: *See*—
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Linde, Theodore R.: *See*—
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Lindsay, Newton E., to Northrop Corporation. Polymer cure determination method. 3,791,792, Cl. 23-230.00r.

Linolite Limited: *See*—
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Linz, Hans: *See*—
Martin, Forst G.; Glutz, Bernhard; and Linz, Hans, 3,790,995.

Lipe, Bruce R., to Allis-Chalmers Corporation. Universal in line and end suction pump arrangement. 3,791,760, Cl. 415-121.000.

Lipp, James P., to Honeywell Information Systems, Inc. Magnetic storage system using alternate codes to reduce write current bias. 3,792,454, Cl. 340-174.10g.

List, Harold A.; and Baker, Jack H., to Bethlehem Steel Corporation. Rolling mill force measuring apparatus. 3,791,204, Cl. 73-88.50r.

Lister, John W., to General Electric Company. Deflection yoke with bridge-connected windings. 3,792,305, Cl. 315-27.0xy.

Little Giant Corporation: *See*—
Maginnis, Francis, 3,791,773.

Little, Lawrence L. Manufacture of cheese curd. 3,792,171, Cl. 99-116.000.

Littmann, Walter Fritz Konrad: *See*—
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Litton Industrial Products, Inc.: *See*—
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Lockheed Aircraft Corporation: *See*—
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Kastan, Howard; and Pena, Joe C., 3,791,234.
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Lockwood Bennett Limited: *See*—
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Lockwood, Peter, to Lockwood Bennett Limited. Stowing and packing debris in mines. 3,791,155, Cl. 61-63.000.

Loe, Winston C. Thermal conductivity element. 3,791,195, Cl. 73-27.00r.

Loew, Wolfgang: *See*—
Schuster, Richard; and Loew, Wolfgang, 3,792,386.

Loftfield, Richard E., to Diamond Shamrock Corporation. Electrolytic cell assemblies and methods of chemical production. 3,791,947, Cl. 204-95.000.

Logan, Ted J., to Procter & Gamble Company, The. Preparation of clear epoxy resins containing high molecular weight triepoxide flexiblizers. 3,792,018, Cl. 260-47.0en.

Lohmann & Stolterfoht Aktiengesellschaft: *See*—
Fleischmann, Erwin; and Watzlawek, Karlheinz, 3,791,497.

Loika, Alexander, Jr., to General Electric Company. Induction watthour meter potential coil mounting. 3,792,353, Cl. 324-137.000.

Loiseau, Paul Marie Henri: *See*—
Nordmann, Joseph; Mattioda, George Dominique; and Loiseau, Paul Marie Henri, 3,792,082.

Long, Alan Gibson: *See*—
Arkley, Vincent; Eardley, Stephen; and Long, Alan Gibson, 3,792,047.

Long, George E.; Johnson, Floyd C.; and Reese, Dennis L., to Grad-Line Inc. Control system for road grader. 3,791,452, Cl. 172-4.500.

Loomis, Russell M.; Enochian, Samuel H.; and McLaughlin, Gerald R., to Unarco Industries, Inc. Pneumatic safety system for vehicle lading. 3,791,310, Cl. 105-369.0ba.

Loomis, Russell M., to Unarco Industries, Inc. Pneumatic safety system for vehicle lading. 3,791,311, Cl. 105-369.0ba.

Lorentz, Connie Wayne. Engine charge timing system. 3,791,354, Cl. 123-90.120.

Losch, Joseph D., to Susquehanna Air Motors, Inc. Air motor. 3,791,333, Cl. 115-34.00r.

Loutzenhiser, Russell H.; Aukrust, Egil; and Meyer, Harry W., to Jones & Laughlin Steel Corporation. Production of stainless steels. 3,791,819, Cl. 75-130.500.

Lovell, Melvin V. Animal handler. 3,791,347, Cl. 119-19.000.

Lowe, Ronald C. Humidifier. 3,791,633, Cl. 261-101.000.

Lowe, Warren, to Chevron Research Company. Lubricating oil compositions. 3,791,971, Cl. 252-33.400.

Lubowitz, Hyman R.: *See*—
Hammond, Aubrey J.; and Lubowitz, Hyman R., 3,791,892.

Lucas, Jan Hendrik, to Nederlandse Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek ten Behoeve van Nijverheid. Film-transporting device. 3,791,565, Cl. 226-67.000.

Lucas, Joseph, (Electrical) Limited: *See*—
Hill, William Frank, 3,792,456.

Lucenti, Gary S., to Algoma Steel Corporation, Limited, The. Method of repairing a beam blank mold. 3,791,015, Cl. 29-401.000.

Luchai, Nonna Alexandrovna: *See*—
Burmistrova, Tamara Petrovna; Bardina, Tatyana Alexandrovna; Galpern, Grigary Davidovich; Karaulova, Elena Nikolaevna; Luchai, Nonna Alexandrovna; Terpilovsky, Nikolai Nikolaevich; and Khitrik, Adolf Alexandrovich, 3,792,095.

Lucore, Richard W.; and Stephenson, Robert L., to Allied Chemical Corporation. Seat belt buckle for use with inflatable bands. 3,791,670, Cl. 280-150.0ab.

Ludwig, Louis. Snap action electric switch. 3,792,212, Cl. 200-68.000.

Luedders, Wilmer L.; and Danneman, Douglas L., to Procter & Gamble Company, The. Dry powder aerosol antiperspirant composition incorporating dry powder antiperspirant active complex and process for its preparation. 3,792,068, Cl. 260-429.300.

Lukuda, Akira. Air leakage detector using a direct pressure system. 3,791,197, Cl. 73-49.300.

Lundy, Cecil Norton: *See*—
Lyall, Angus Alexander; and Lundy, Cecil Norton, 3,792,183.

Lundy, Dan Haston: *See*—
Wissmiller, Ivan Lee; and Lundy, Dan Haston, 3,792,331.

Lupinacci, Geno. Method of developing a proper golf club swing. 3,791,654, Cl. 273-186.00a.

Lyall, Angus Alexander; and Lundy, Cecil Norton, to Nabisco, Inc. Cereal coating composition and process. 3,792,183, Cl. 426-307.000.

Lyall Electric, Inc.: *See*—
Smith, Gregory A., 3,792,414.

Lynn, Scott; and Forrester, Richard C., III, to University of California, The Regents of the. Method for recovering ammonia and hydrogen chloride from ammonium chloride. 3,792,153, Cl. 423-319.000.

Lysak, David A.: *See*—
Moreno, Victor; and Lysak, David A., 3,791,283.

Maag, Helmut: *See*—
Krall, Heribert A.; and Maag, Helmut, 3,791,258.

Macey, Frank G.: *See*—
Durante, Anthony C.; and Macey, Frank G., 3,792,235.

MacFarland, Charles H., to Scott & Fetzer Company, The. Drive means for vacuum cleaner. 3,790,987, Cl. 15-392.000.

MacHenry, Richard, to FMC Corporation. Spectrophotometer attachment for testing yarn dyeing qualities. 3,791,745, Cl. 356-244.000.

Machinenfabrik B. Maier K.G.: *See*—
Schaefer, Karl, 3,791,428.

Mack, Leeqett. Apparatus for molding and cooking egg products. 3,791,285, Cl. 99-419.000.

Mack, Walter: *See—*
Hekimian, Norris C.; and Mack, Walter, 3,792,357.

Mackay, Anthony. Reflecting telescope system. 3,791,713, Cl. 350-83.000.

MacLennan, Roderick A.: *See—*
Bochnak, Gregory; and MacLennan, Roderick A., 3,791,775.

MacMillan, Charles W. Fail-safe throttle control. 3,791,366, Cl. 123-198.0db.

Macune, Charles W.; and Parrish, Walter J., to Kodata, Inc. Dual printing apparatus with selective hammer arming means. 3,791,291, Cl. 101-69.000.

Madden, James Joseph, to Bell Telephone Laboratories, Incorporated. Printed wiring board terminal assembly. 3,792,412, Cl. 339-17.00c.

Madeira, John W., to Plasti-Kote Company; a division of Consolidated Foods, Inc. Tamper-proof closure for spray cans. 3,791,551, Cl. 220-60.000.

Mador, Irving L.: *See—*
McClain, Dorothee M.; Heller, Carol A.; and Mador, Irving L., 3,792,087.

Maginnis, Francis, to Little Giant Corporation. Submersible pump. 3,791,773, Cl. 417-423.000.

Magnetfabrik Bonn GmbH: *See—*
Steingroever, Erich, 3,791,864.

Magneville, Pierre; and Ducongi, Claude, to Institut Francais du Petrole. Device for generating acoustic waves in a liquid medium. 3,792,425, Cl. 340-12.00r.

Mahaffy & Harder Engineering Company: *See—*
Mahaffy, Reid A.; and Hamilton, Joel A., 3,792,181.

Mahaffy, Reid A.; and Hamilton, Joel A., to Mahaffy & Harder Engineering Company. Semi-rigid plastic package with reclosable seal. 3,792,181, Cl. 426-123.000.

Maierson, Theodore, to National Cash Register Company, The. Sprayable and aerosolizable UEB-forming compositions. 3,791,983, Cl. 252-305.000.

Makajima, Taiitsu: *See—*
Hokao, Zenjiro; and Makajima, Taiitsu, 3,791,697.

Malec, Robert E.: *See—*
Ihrman, Kryn G.; and Malec, Robert E., 3,792,014.

Maleck, Leroy R. Clear ice pellet maker. 3,791,166, Cl. 62-138.000.

Maley, James John; and Bartch, Donald Walter, to RCA Corporation. Cathode-ray tube having conductive internal coating comprised of iron oxide and graphite. 3,791,546, Cl. 220-2.10a.

Mallet, Maurice: *See—*
Gattus, Jean; and Mallet, Maurice, 3,792,019.

Mallico, Charles D., to Enthone, Incorporated. Pre-conditioner concentrate. 3,791,986, Cl. 252-355.000.

Mallory, P. R., & Co., Inc.: *See—*
Angelovich, Stephen J., 3,791,873.

Manaka, Shiro: *See—*
Mita, Ikuo; Kawamura, Hiroyuki; and Manaka, Shiro, 3,791,943.

Mandell, Darla R., to Merrick Industries, Inc. Solid state vend control means and process of operation. 3,791,505, Cl. 194-10.000.

Manfre, Giovanni; and Vianello, Domenico, to Montecatini Edison S.p.A. Apparatus for making a glass or the like coated wire. 3,791,172, Cl. 65-11.000.

Manigault, Edward L., to Taylor, Chas., & Sons, The. Zircon refractory compositions. 3,791,834, Cl. 106-57.000.

Mannesmann Aktiengesellschaft: *See—*
Pfeiffer, Gerd; Kran, Hans-Peter; and Feldmann, Wilhelm, 3,791,184.

Mansfield Sanitary, Inc.: *See—*
Derror, Fred L., 3,792,149.

Marcalus, Robert L. Method and apparatus for securing the tail convolution of a roll. 3,791,907, Cl. 156-253.000.

Marchand, Andre M., to Ateliers Roannais de Constructions Textiles. Yarn guiding apparatus. 3,790,996, Cl. 28-71.300.

Marchignoni, Albano. Exercising and teaching apparatus for limb training and for teaching swimming. 3,791,646, Cl. 272-71.000.

Maremont Corporation: *See—*
McNally, Sellers B., 3,791,494.

Marie, Gerard Joseph Marcel: *See—*
Donjon, Jacques; Hazan, Jean-Pierre; and Marie, Gerard Joseph Marcel, 3,792,259.

Marine Construction & Design Co.: *See—*
Viljoen, Johan P., 3,791,625.

Mark & Son, Ltd.: *See—*
Bucks, Robert M.; and Ayars, Frederick M., 3,792,445.

Mark, John Thomas, to RCA Corporation. Means for ensuring starting of gas laser. 3,792,372, Cl. 331-94.500.

Marks, Alvin M. Electrostatic generator with charging and collecting arrays. 3,792,293, Cl. 310-5.000.

Marlo Company, Inc., The: *See—*
Zumeta, Julio; and Case, Edward M., 3,791,658.

Marnett, Paul J. Automated dog kennel. 3,791,348, Cl. 119-19.000.

Marnoch, Robert Haldane. Scaffolding. 3,791,486, Cl. 182-132.000.

Marshall, Edward W.: *See—*
Bliss, Arthur E.; and Marshall, Edward W., 3,792,495.

Martial, Jean Paul Jules, to Fabrique Nationale Hestal S.A. en Abrege FN. Top lever mechanism for firearms. 3,791,062, Cl. 42-44.000.

Martin, David B., to Honeywell Information Systems, Inc. Automatic redial memory device for telephones. 3,792,203, Cl. 179-90.00b.

Martin, Forst G.; Glutz, Bernhard; and Linz, Hans, to Societe de la Viscose Suisse. Apparatus for the preparation of polyethylene terephthalate filaments. 3,790,995, Cl. 28-59.500.

Martin, Robert L., to Rimar Manufacturing, Inc. Decorative grill joint. 3,791,095, Cl. 52-758.00h.

Martin, Sidney G.: *See—*
Frank, Robert L.; Martin, Sidney G.; and Smith, Clayton S., 3,791,812.

Maruoka, Hiroyuki: *See—*
Masaki, Kenji; and Maruoka, Hiroyuki, 3,791,358.

Maruyama, Shoji; Saito, Tadashi; Yoshida, Shigeaki; and Shimada, Masaru, to Kabushiki Kaisha Ricoh. Diazotype photoprinting material. 3,791,832, Cl. 96-91.00r.

Marx, Gerhard, to Kalle Aktiengesellschaft. Device for creating electrostatic charge or discharge. 3,792,312, Cl. 317-2.00f.

Marx, Oskar: *See—*
Vernazza, Julius; and Marx, Oskar, 3,791,489.

Masaki, Kenji; and Maruoka, Hiroyuki, to Nissan Motor Company, Limited. Carburetor control mechanism for an automotive gasoline powered internal combustion engine. 3,791,358, Cl. 123-117.00r.

Massachusetts Institute of Technology: *See—*
Gibby, Michael G.; Pines, Alexander; and Waugh, John S., 3,792,346.
Hocker, Lon; and Smith, Irl W., Jr., 3,792,245.

Massie, Harold Lee: *See—*
Hochberg, Howard Martin; and Massie, Harold Lee, 3,791,378.

Masson Scott Thrissell Engineering Limited: *See—*
Wood, David, 3,791,515.

Matelan, Edward M. Roller coaster. 3,791,305, Cl. 104-69.000.

Mather & Platt Limited: *See—*
Barlow, Colin, 3,791,513.

Mathis, Ronald D.: *See—*
Dunn, Howard E.; and Mathis, Ronald D., 3,792,013.

Mathis, Victor C.: *See—*
Stober, Leslie V., Jr.; and Mathis, Victor C., 3,791,036.

Matkan, Josef; and O'Connor, Kevin Douglas, to Canon Kabushiki Kaisha, mesne. Electrostatic stylus recording with self-cleaning drum. 3,792,494, Cl. 346-74.0es.

Matsubishi Denki Kabushiki Kaisha: *See—*
Saita, Toshikazu, 3,791,356.

Matsuda, Isamu: *See—*
Katagiri, Toshio; Suga, Tokuji; Omiya, Shoji; and Matsuda, Isamu, 3,792,335.

Matsushita Electric Industrial Co., Ltd.: *See—*
Katagiri, Toshio; Suga, Tokuji; Omiya, Shoji; and Matsuda, Isamu, 3,792,335.
Katakabe, Noboru, 3,792,488.
Miyagi, Kiyoshi, 3,791,712.
Yamashita, Tadaoki; Yamamoto, Osamu; Oonishi, Hajimo; Kawabata, Hidetsogu; and Kitamura, Saburo, 3,792,277.

Matsushita Electric Industries Co., Ltd.: *See—*
Ota, Isao, 3,792,308.

Mattioda, George Dominique: *See—*
Nordmann, Joseph; Mattioda, George Dominique; and Loiseau, Paul Marie Henri, 3,792,082.

Mattis, James J.: *See—*
Tecotzky, Melvin; and Mattis, James J., 3,791,844.

Matysek, John J. Traffic control system. 3,792,431, Cl. 340-41.000.

Mauch, Floyd. Lifting apparatus. 3,791,542, Cl. 214-370.000.

Maui Land & Pineapple Company, Inc.: *See—*
Tsutsumi, Masato, 3,791,321.

Maurer, Robert Distler, to Corning Glass Works. Method of producing glass for optical waveguides. 3,791,714, Cl. 350-96.0wg.

Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See—*
Rohde, Wolfgang; and Lezius, Axel, 3,791,928.

Maxwell, John Augustus; and Merrill, Michael Wallace, to Keir-McGee Chemical Corporation. Method of roasting vanadium bearing materials. 3,792,150, Cl. 423-68.000.

Maxwell, Neil J. Anchor for holding a fish while working on the same. 3,790,988, Cl. 17-18.000.

May & Baker Limited: *See—*
Sharp, Brian William; Warburton, Dennis; and Wooldridge, Kenneth Robert Harry, 3,792,052.

May, Vernon Bruce: *See—*
Brown, Patrick Michael; and May, Vernon Bruce, 3,791,836.

Mays, Hal N. Reducing valve for high pressure fluids and connecting means therefor. 3,791,412, Cl. 137-614.110.

Mazzei, Marcello: *See—*
Fattore, Vittorio; Mazzei, Marcello; and Notari, Bruno, 3,792,107.

McAvoy, Charles R. Cover assembly. 3,791,665, Cl. 280-150.00r.

McCallie, Charles W.: *See—*
Wiser, Verlon E.; and McCallie, Charles W., 3,791,504.

McCallum, James B., to Itek Corporation. Pressure applicator for surface generating apparatus. 3,791,079, Cl. 51-56.000.

McCauley, Philip J.: *See—*
Wyndham, John L.; Stevens, Wayne E.; and McCauley, Philip J., 3,791,790.

McClain, Dorothee M.; Heller, Carol A.; and Mador, Irving L., to National Distillers and Chemical Corporation. Vapor phase oxidation of ethylene to acetic acid. 3,792,087, Cl. 260-533.00r.

McConnell, Lorne D.; and Mockli, Rolf, to I-T-E Imperial Corporation. Coaxial conductor connector and gland for two-pressure circuit breaker. 3,792,217, Cl. 200-148.00b.

McCutcheon, James T., to Itek Corporation. Liquid toner applicator. 3,791,345, Cl. 118-637.000.

McDonald, Bernard, to McDonald Medical Laboratories and Instrument Company. Tracheotomy method and means. 3,791,386, Cl. 128-305.000.

McDonald, Clement J., to Multi Electric Mfg., Inc. Strobe light intensity control. 3,792,309, Cl. 315-200.00a.

McDonald Medical Laboratories and Instrument Company: *See*—
McDonald, Bernard, 3,791,386.

McElhaney, James H.: *See*—
Roberts, Verne L.; and McElhaney, James H., 3,791,694.

McElhose, Herman William; and Salow, William Robert, to Deere & Company. Weather cap for exhaust pipe. 3,791,282, Cl. 98-59.000.

McFiggins, Robert B.; and Eckert, Alton B., Jr., to Pitney-Bowes, Inc. Remote postage meter resetting method. 3,792,446, Cl. 340-172.500.

McGahan, Thomas Edward: *See*—
Dixon, Richard Wayne; Hackett, William Harold, Jr.; and McGahan, Thomas Edward, 3,791,948.

McGee, Sherwood W., to Amsted Industries, Inc. Powder metallurgy aluminum parts. 3,791,800, Cl. 29-182.500.

McGoffey, Jesse E. Impact fire safety switch. 3,792,211, Cl. 200-61.45r.

McGowan, Edward J., Jr.: *See*—
Winkler, Edward R.; and McGowan, Edward J., Jr., 3,791,373.

McGusty, Elizabeth R.; and Sutton, Blaine M., to Smithkline Corporation. Phosphine or phosphite gold complexes of thiomalic acid in treating arthritis. 3,792,165, Cl. 424-215.000.

McIntire, Hoy O.: *See*—
Joyce, John F.; and McIntire, Hoy O., 3,791,798.

McKee, Ian K., to Circuit Materials Division Dodge Industries, Inc. Method of laminating polyimide film. 3,791,909, Cl. 156-306.000.

McKee, James Glen, to Canadian Industries, Limited. Explosive package. 3,791,297, Cl. 102-24.00r.

McLaughlin, Donald L.: *See*—
Arnold, Edward H.; and McLaughlin, Donald L., 3,792,466.

McLaughlin, Gerald R.: *See*—
Loomis, Russell M.; Enochian, Samuel H.; and McLaughlin, Gerald R., 3,791,310.

McLean, Michael B.; Krishnaiyer, Ramesh; and Rasmussen, Allen, to Johnson Service Company. Multiplexed alarm transmission system having alarm storage circuits. 3,792,469, Cl. 340-409.000.

McLeod, Ian C. Method and apparatus for indirect electrical ignition of combustible powders. 3,791,302, Cl. 102-70.20a.

McLyman, Colonel William T., to United States of America, National Aeronautics and Space Administration. Banded transformer cores. 3,792,399, Cl. 336-210.000.

McNally, Sellers B., to Maremont Corporation. Temperature compensating means for a hydraulic shock absorber. 3,791,494, Cl. 188-277.000.

McNeil Corporation: *See*—
Thomas, Roger V., 3,791,529.

McNeill, William, to Duromag Coatings Inc. Protective coating for magnesium. 3,791,942, Cl. 204-56.00m.

McPeak, Earl W., Jr.: *See*—
Canup, Robert E.; and McPeak, Earl W., Jr., 3,792,261.

McPherson, Alexander J.; and Scheer, Herman C., to International Business Machines Corporation. Method of forming multi-layer circuit panels. 3,791,858, Cl. 117-201.000.

Meason, M. M., Inc.: *See*—
Roscoe, William A., 3,791,426.

Meek, James M.; Ravilious, Clarence F.; and Heinard, Whilden G., to United States of America, Army. Schwarzschild radar antenna operable in sector scan and conical scan modes with anti-blockage reflector. 3,792,474, Cl. 343-756.000.

Meermans, Matheus Johannes Marie, to U.S. Philips Corporation. Magnetic recording and/or playing back apparatus. 3,791,604, Cl. 242-68.300.

Meier, Udo H., to Reliance Electric Company. Combining inverters for harmonic reduction. 3,792,286, Cl. 307-58.000.

Meinhardt, Gunter: *See*—
Von Bonin, Wulf; Geiger, Julius; Meinhardt, Gunter; Meyer, Karl-Otto; Wagenknecht, Werner; and Himmelmann, Wolfgang, 3,791,831.

Meji Seika Kaisha, Ltd.: *See*—
Fukatsu, Shunzo; Ishikawa, Tetsuo; Miura, Taro; Niida, Taro; Noniya, Bunzo; and Koeda, Takemi, 3,792,035.

Melchiore, John J.: *See*—
Mills, Ivor W.; and Melchiore, John J., 3,791,959.

Mencacci, Samuel Alfred, to International Machinery Corporation S.A. Spinner nozzle for air blast orchard sprayer. 3,791,582, Cl. 239-222.170.

Meoni, Angelo, to Cemsa. Method of reproducing flat keys and tools used to this end. 3,791,240, Cl. 76-110.000.

Merchant, Kamal, to Licentia Patent-Verwaltungs-G.m.b.H. Method of manufacturing a semiconductor region. 3,791,885, Cl. 148-187.000.

Merck & Co., Inc.: *See*—
Jensen, Norman P.; Shen, Tsung-Ying; and Windholz, Thomas B., 3,792,057.
Shen, Tsung-Ying; and Witzel, Bruce E., 3,792,170.

Merck Patent Gesellschaft Nat: *See*—
Eisenbeiss, Friedhelm; and Ehlerding, Susanne, 3,791,522.

Merges, John C., Jr.: *See*—
Duling, Irl N.; and Merges, John C., Jr., 3,791,856.

Merrick Industries, Inc.: *See*—
Mandell, Darla R., 3,791,505.

Merrill, Michael Wallace: *See*—
Maxwell, John Augustus; and Merrill, Michael Wallace, 3,792,150.

Merry Jumpsuits: *See*—
Ealy, Mary I., 3,790,963.

Merten, Rudolf: *See*—
Zecher, Wilfried; and Merten, Rudolf, 3,792,061.

Mertwoy, Abraham: *See*—
Messina, Joseph F.; and Mertwoy, Abraham, 3,791,976.

Merz, Lee Irving: *See*—
Arrington, William Lee; and Merz, Lee Irving, 3,792,387.

Mesly, Xavier, to Bombardier Limited. Method and apparatus for making endless belts. 3,791,897, Cl. 156-137.000.

Messer-Schmidt, Sebastian, Spezialmaschinenfabrik: *See*—
Messerschmidt, Klaus, 3,791,083.

Messerschmidt, Klaus, to Messer-Schmidt, Sebastian, Spezialmaschinenfabrik. Apparatus for machining balls. 3,791,083, Cl. 51-117.000.

Messerschmit-Bolkow-Blohm Gesellschaft mit beschrankter Haftung: *See*—
Stengel, Max; Kollmer, Werner; and Grassl, Manfred, 3,792,189.

Messina, Joseph F.; and Mertwoy, Abraham, to United States of America, Army. Method for rapidly operating ground equipment embodying hydraulic system using all season petroleum hydraulic fluid. 3,791,976, Cl. 252-75.000.

Metaframe Corporation: *See*—
Willinger, Allan H.; and Dinnerstein, Albert J., 3,791,346.

Metcalf, Eric; and Dorey, Howard Anthony, to Solartron Electric Group Limited, The. Analog to digital converter utilizing different feedback effects to obtain accuracy and resolution. 3,792,352, Cl. 324-99.00d.

Meter, Robert B. Knit fabric. 3,791,178, Cl. 66-196.000.

Metge, Emile, to Union Industrielle Blanzy Quest. Boring tool. 3,791,465, Cl. 175-373.000.

Metramatic Corporation: *See*—
Vanderhoof, Frank B., 3,791,518.

Metritape, Inc.: *See*—
Ehrenfried, Albert D.; Pierce, Norton T.; and Ide, Mason G., 3,792,407.

Mey, Hansjurc, to Leemann, Walter, A.G. Fabrik fur fototechnische, elektronische und feinmechanische Apparate. Microfilm camera and light source therefor. 3,791,734, Cl. 355-67.000.

Meyer, Bruce L., to Control Data Corporation. Communications connector apparatus utilizing radiant energy. 3,792,208, Cl. 200-51.00r.

Meyer, Harry W.: *See*—
Loutzenhiser, Russell H.; Aukrust, Egil; and Meyer, Harry W., 3,791,819.

Meyer, Karl-Otto: *See*—
Von Bonin, Wulf; Geiger, Julius; Meinhardt, Gunter; Meyer, Karl-Otto; Wagenknecht, Werner; and Himmelmann, Wolfgang, 3,791,831.

Meyer, Maurice J., to NN Industries, Inc. Method and apparatus for making colored expanded foam articles. 3,791,631, Cl. 259-8.000.

Meyer, William J.: *See*—
Staehlin, John H.; and Meyer, William J., 3,791,262.

Michel, George P., to Westinghouse Electric Corporation. Electrical inductive apparatus having sheet and strap wound windings. 3,792,395, Cl. 336-5.000.

Michigan Instruments, Inc.: *See*—
Folkerth, Ilden R., 3,791,403.

Midwestern Specialties, Ltd.: *See*—
Neal, Dennis, 3,791,842.

Mihalik, Nandor, to Gestetner Copiers Limited. Transport means for sheets. 3,791,731, Cl. 355-3.00r.

Miheles, Aurel: *See*—
Horvath, Stefan; and Miheles, Aurel, 3,791,733.

Mikalik, Nandor; Moss, Andrew Anthony; and Prince, John Charles Henry, to Gestetner Copiers Limited. Electrostatic copier. 3,791,732, Cl. 355-14.000.

Milazzo, Carl J.; and Hohl, Frank J., to Hohl Machine & Conveyor Co., Inc. Accumulating conveyor. 3,791,510, Cl. 198-127.00r.

Miles Laboratories, Inc.: *See*—
Erickson, Robert Joseph; Kotick, Michael Paul; Reverman, Lawrence Francis; and Wilson, Dan P., 3,792,039.

Miles, Thomas D.; and Delasanta, Armando C., to United States of America, Army. Flame retardant fabric blends. 3,791,854, Cl. 117-136.000.

Miller, Harold L. Gate arm clamp and serrating lever. 3,791,072, Cl. 49-141.000.

Miller, Harry, to Sperry Rand Corporation. Angle of attack computer. 3,791,208, Cl. 73-180.000.

Miller, John W., to Lockheed Aircraft Corporation. Low inertia film drive and cassette. 3,791,726, Cl. 352-166.000.

Miller, Sanford A.: *See*—
Frankenfeld, John W.; and Miller, Sanford A., 3,791,241.

Mills, Ivor W.; and Melchiore, John J., to Sun Oil Company of Pennsylvania. Blended refrigeration oil composition. 3,791,959, Cl. 208-19.000.

Mills, Junstin W., Jr.: *See*—
Strople, Gordon N.; and Mills, Junstin W., Jr., 3,791,424.

Mims, Bruce L., to Branson Incorporated. Vibratory welding apparatus. 3,791,569, Cl. 228-1.000.

Mineral & Chemical Resource Company: *See*—
Clitheroe, Jay B., 3,791,104.

Minigrip, Inc.: *See*—
Herz, Andre, 3,790,992.

Minister of National Defence, Her Majesty the Queen: *See*—
Slaght, William Francis; and Boutin, Julien F., 3,792,354.
Minnesota Mining & Manufacturing Company: *See*—
Hill, Brian K.; and Kehr, J. Alan, 3,792,016.
Minnesota Mining and Manufacturing Company: *See*—
Ahlberg, Carl S.; and Drongeson, John W., 3,791,722.
Minolta Camera Kabushiki Kaisha: *See*—
Hirata, Hiroshi, 3,791,724.
Kobori, Toshio; and Ohba, Masaru, 3,791,277.
Tsujimoto, Kayoshi; and Fujii, Yoshifusa, 3,792,484.
Ueda, Hiroshi; and Egawa, Takeshi, 3,791,276.
Minushkin, Bertram; and Kissel, George, to United States of America, Atomic Energy Commission. Self-sealing electrochemical oxygen meter. 3,791,953, Cl. 204-195.00s.
Mirabed AG: *See*—
Lehmann, Walter, 3,790,972.
Misley, Paul R.: *See*—
Sibert, Ralph R.; and Misley, Paul R., 3,791,252.
Missel, Leo, to International Business Machines Corporation. Ultrasonic bonding of cubic crystal-structure metals. 3,791,028, Cl. 29-628.000.
Mistarz, Robert J., to Koehring Company. Denester synchronizer apparatus and method. 3,791,894, Cl. 156-60.000.
Mita, Ikuo; Kawamura, Hiroyuki; and Manaka, Shiro, to Tokyo Kaken Kogyo Co., Ltd. Process for after treatment of anodic or chemical conversion coatings of aluminum alloys. 3,791,943, Cl. 204-56.000.
Mitchell, David S.; Bridge, Alan G.; and Jaffe, Joseph, to Chevron Research Company. Catalyst rejuvenation with oxalic acid. 3,791,989, Cl. 252-413.000.
Mitchell, Edward: *See*—
Stana, Regis R.; Mitchell, Edward; and Coffay, John B., 3,791,526.
Mitchell Industries, Inc.: *See*—
Younkin, James R., 3,792,427.
Mitchell, Robert W., to Stewart & Stevenson Services, Inc. Turbine driven electrical generator. 3,791,682, Cl. 290-2.000.
Mitsubadenkiseisakusho Co., Ltd.: *See*—
Hatsugai, Akitomi; and Ishida, Kazuyuki, 3,792,405.
Mitsubishi Chemical Industries Limited: *See*—
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Moffatt, John G.; and Russell, Alan F., to Syntex Corporation. Acyl derivatives of 02,2 -anhydro-1 (beta-D-arabinofuranosyl)-cytosines and methods of preparing. 3,792,040, Cl. 260-211.50r.
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Molitorisz, Joseph, to Rotopak Systems Inc. Method for compacting fibrous material. 3,791,286, Cl. 100-40.000.
Molitorisz, Joseph, to Rotopak Systems, Inc. Apparatus for compacting fibrous material. 3,791,287, Cl. 100-89.000.
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Moyer, Ross; and Karandy, Fred, to Carrier Corporation. Apparatus for attaching solder rings to work pieces. 3,791,005, Cl. 29-200.00b.

Moyer, Rudolph H.; and Sibbett, Donald J., to Geomet, Incorporated. Rapid methods for assay of enzyme substrates and metabolites. 3,791,933, Cl. 195-127.000.

Mudde, John P., to CPC International Inc. Vapor permeable compositions. 3,792,009, Cl. 260-31.40r.

Mueller, Herbert, to Badische Aniiin- & Soda-Fabrik Aktiengesellschaft. Manufacture of isoprene. 3,792,104, Cl. 260-681.000.

Mueller-Westerhoff, Ulrich T.: *See—*
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Muhling, Alois; Schmidt, Helmut; and Knie, Hans, to Siemens Aktiengesellschaft. Electric motor driven timing relay with components disposed on one side of supporting frame. 3,792,207, Cl. 200-35.00r.

Muller, Egon. Teaching aid for demonstrating the harmonic system. 3,791,254, Cl. 84-471.000.

Muller, John T.; and Cooper, James H., to Leslie Co. Pressure reducing valve spool. 3,791,413, Cl. 137-625.300.

Muller, Wolfgang: *See—*
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Muntz, Eric P.; and Welkowsky, Murray S., to Xonics, Inc. Enhancement of images in electron radiography. 3,792,265, Cl. 250-315.000.

Murakoshi, Makoto, to Fuji Photo Film Co., Ltd. Coordinate indication device on microfilm. 3,792,440, Cl. 340-172.500.

Murari, Bruno: *See—*
Bondini, Arnaldo; and Murari, Bruno, 3,792,316.

Murayama, Naohiro; and Okiawa, Takao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Acoustic transducer using a piezoelectric polyvinylidene fluoride resin film as the oscillator. 3,792,204, Cl. 179-111.00a.

Murib, Jawad H.: *See—*
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Murphy, John D. Flashlight and switch assembly. 3,792,389, Cl. 335-205.000.

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Musick, Charles R., to Combustion Engineering, Inc. Thermal margin protection system for a nuclear reactor. 3,791,922, Cl. 176-20.000.

Mustafin, Karl Batyrbekovich: *See—*
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Nagashima, Shinichiro; and Watanabe, Toshio, to Canon Kabushiki Kaisha. Method of recording by heat sensitive multicolor indication. 3,792,481, Cl. 346-1.000.

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Nakamura, Yoshiatsu; and Odashima, Susumi, to Kabushiki Kaisha Komatsu Seisakusho. Governor for controlling the fuel delivery of a fuel injection pump for an internal combustion engine. 3,791,362, Cl. 123-140.00r.

Nakane, Mototaka, to Aisen Seiki Kabushiki Kaisha. Clutch with wear compensating spring. 3,791,502, Cl. 192-111.00a.

Nakatani, Hiromi; and Katagiri, Kiyoshi, to Takeda Chemical Industries, Ltd. Phosphate-hydrogen peroxide adduct as a food preservative. 3,792,177, Cl. 426-178.000.

Nakatsuji, Shinichi; and Suzuki, Keisuke, to Kabushiki Kaisha Konatsu Seisakushi. Apparatus for detecting the position of a movable article under water. 3,792,424, Cl. 340-6.00r.

Nakayama, Kiyoshi; and Araki, Kazumi, to Kyowa Hakko Kogyo Co., Ltd. Process for producing L-histidine. 3,791,925, Cl. 195-29.000.

Nakazawa, Kiwao; and Sasayama, Shinya, to Nippon Kogaku K. K. Digital measuring apparatus. 3,791,735, Cl. 356-4.000.

Nalco Chemical Company: *See—*
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Napoli, Louis Sebastian; and Hughes, John Joseph, to RCA Corporation. Coaxial magnetic slug tuner. 3,792,385, Cl. 333-97.00r.

Narusawa, Shozo; Itzuka, Oshi; and Kawasaki, Jiro, to Yurin Tokushu Kogyo Co., Ltd. Moisture-proof seal for containers. 3,791,545, Cl. 215-274.000.

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National Union Electric Corporation: *See—*
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Nawman, Rollie B., to Benner-Nawman, Inc. Telephone book holder. 3,791,677, Cl. 281-46.000.

Neace, Samuel E. Air bearing multi-channel magnetic head assembly. 3,792,492, Cl. 360-103.000.

Neal, Dennis, to Midwestern Specialties, Ltd. Process of applying powder to a rotating object. 3,791,842, Cl. 117-16.000.

Nederlandse Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek ten Behoeve van Nijverheid: *See—*
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Needham, James C.; and Boughton, Peter, to Welding Institute, The. Welding power source. 3,792,225, Cl. 219-131.00r.

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Nelsen, Arlyn Ray; and Steuerwald, Wilfred Leeroy, to Deere & Company. Tractor-mounted mower. 3,791,115, Cl. 56-15.200.

Nelson, Axel B.; and Spacko, Roman F., to Sloan Valve Company. Quiet flow device for flush valves. 3,791,618, Cl. 251-37.000.

Nelson, Richard E., to Dover Corporation. Pump rotor adjustment mechanism. 3,791,779, Cl. 418-30.000.

Nelson, Roy A. Orchard tree covering device. 3,791,069, Cl. 47-21.000.

Nelson, Wesley C. Valve shutoff device. 3,791,396, Cl. 137-38.000.
Neuroth, Charles George, to Stauffer Chemical Company, mesne. Curable organopolysiloxanes. 3,792,008, Cl. 260-30.6sb.
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Newburg, Ronald G., to United States of America, Air Force. Method and apparatus utilizing the phase velocity difference of light rays for measuring the velocity of a moving object. 3,791,736, Cl. 356-27.000.
Newburgh, Ronald G., to United States of America, Air Force. Ring laser utilizing an optical retardation plate to prevent beam locking. 3,791,738, Cl. 356-106.01r.
Newcombe, Jack; Dotson, Anderson O., Jr.; and Olechowski, Jerome Robert, to Cities Service Company. Cyclododecylmethyl cyclododecanecarboxylates. 3,792,078, Cl. 260-468.00r.
Newcombe, Jack, to Cities Service Company. Non-catalytic oxidation of cyclododecnecarboxaldehyde to cyclododecanecarboxylic acid. 3,792,085, Cl. 260-514.00r.
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Nisser, Henrik; Wolf, Jakob; Schoen, Werner A.; and Schoffmann, Ernst Albert, to Voith, J. M., GmbH. Suction box arrangement for papermaking machine having partition wall between the top and bottom. 3,791,920, Cl. 162-363.000.
Nittan Company, Limited: *See—*
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Niven, Francis J., Jr., to Dresser Industries, Inc. Digital count rate meter and depth delay system for well logging. 3,792,430, Cl. 340-18.0de.
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Nobusawa, Tsukumo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Automatic camera shutter controls with storage or pulse voltages. 3,791,272, Cl. 95-101.0ct.
Noda, Makoto; and Kajita, Takeshi, to NGK Insulators, Ltd. Device for measuring oxygen concentration of molten metal. 3,791,954, Cl. 204-195.00s.
Nollen, Johann Theodor, to Verlichtings-en Metaalwaren Industrie "-Gouda-Holland" N.V., Industrieterrein. Cable channel. 3,791,613, Cl. 248-49.000.
Nomura, Katsuhiko, to Asahi Kogaku Kogyo Kabushiki Kaisha. Spring-actuated mechanism. 3,791,639, Cl. 267-155.000.
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Norburn, William Carl. High temperature recording lance. 3,791,209, Cl. 73-359.000.
Norby, Thomas E.; and Rogers, Charles H. Radio capsule battery. 3,791,377, Cl. 128-2.00p.
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Norlander, Lars Ake Wilhelm. Mountable staircase, ladder or the like. 3,791,485, Cl. 182-106.000.
Norlin, Alf Helge Bernhard; Olsson, Natanael; and Strid, Tore Sven, to Telefonaktiebolaget L M Ericsson. Bobbin end plate with means for fastening of soldering tabs. 3,792,398, Cl. 336-192.000.
North American Rockwell Corporation: *See—*
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Nuehring, Donald E., to Zenith Radio Corporation. Method for applying an internal coating to a cathode ray tube. 3,791,846, Cl. 117-38.000.
Nunlist, Erwin J.; and Coleman, Howard G., to Sybron Corporation. Spray cleaning system. 3,791,583, Cl. 239-227.000.
Nup Nau, Arthur E., to Bell & Howell. Indexing mechanism. 3,791,622, Cl. 352-123.000.
Nuss, Christopher, to Chrysler Corporation. Automobile accessory drive. 3,791,147, Cl. 60-422.000.
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Oatley, Gerald Arthur. Cooking ovens. 3,791,371, Cl. 126-339.000.
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O'Dea, Orrin B., to Communication Mfg. Co. Hand held telephone test instrument. 3,792,205, Cl. 179-175.000.

O'Dea, Orrin B.; and Hanneman, Thomas W., to Garrett, Jim C., Johnson, Robert H. and Shelton, Jack. Microminiature switch construction. 3,792,210, Cl. 200-61.590.

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Offutt, Worthington W. Method of structural fabrication. 3,792,141, Cl. 264-47.000.

Ogata, Koichi; Yamada, Hideake; Enei, Hitoshi; and Okumura, Shinji, to Ajinomoto Co., Inc. Biological method of producing phenolic amino acids. 3,791,924, Cl. 195-29.000.

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Ogawa, Mutsuo; and Satake, Yoshiaki, to Ricoh Co., Ltd. Scanning initiation position detecting device. 3,792,262, Cl. 250-223.00r.

Ogawa, Shozo; Ametani, Kiyoshi; and Samejima, Kenro, to Toray Engineering Co. Ltd. Apparatus for measuring the resistance of a variable resistance element located in a rotating body. 3,792,342, Cl. 323-68.000.

Ogiue, Katumi, to Hitachi, Ltd. Method of manufacturing semiconductor devices utilizing simultaneous deposition of monocrystalline and polycrystalline regions. 3,791,882, Cl. 148-174.000.

Ohba, Masaru: *See—*
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Oseroff, Israel; and Yallum, Rocco M. Apparatus for pulverizing and incinerating household waste. 3,791,318, Cl. 110-8.00r.

O'Shea, Robert P.: *See—*
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Oude Alink, Bernardus A., to Petrolite Corporation. 1,2-Dithiolium compounds as corrosion inhibitors. 3,791,789, Cl. 21-2.50r.

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Pan, Bingham Y. K.; Carton, John R.; and Parker, Robert V., to Monsanto Company. Interbed seal for multibed reactors. 3,791,795, Cl. 23-288.00r.

Panu, Vaino Tuure Kalevi, to Oy Stromberg Ab. Voltage transformer. 3,792,396, Cl. 336-69.000.

Panzer, Hans Peter; Firth, William Charles, Jr.; Coscia, Anthony Thomas; and Palmer, Lucille Elma, to American Cyanamid Company. Novel copolymers. 3,792,027, Cl. 260-73.00r.

Papoff, Paolo; and Impedovo, Sebastiano, to Snam Progetti, S.p.A. Peristaltic pump with a plurality of continuously adjustable channels. 3,791,777, Cl. 417-475.000.

Park Electrochemical Corporation: *See—*
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Parker, Levi C.: *See—*
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Partridge, Harold Devere, to Hooker Chemical Corporation. Activated chlorate. 3,791,979, Cl. 252-187.000.

Pascucci, Vito; and Stubbins, William H., to Leblanc, G., Corporation. Clarinet mouthpiece with improved ligature. 3,791,253, Cl. 84-383.000.

Pasternak, Stephen F., to Peerless of America, Incorporated. Method of fabricating a plural finned heat exchanger. 3,791,003, Cl. 29-157.30b.

Paterson, David N. Board game apparatus. 3,791,648, Cl. 273-131.0ab.

Patil, Arvind S.; Rice, Rip G.; and Raus, John W., to Grace, W. R., & Co. Process for preparing vermivulite permselective membranes. 3,791,969, Cl. 210-23.000.

Patterson, John F.; Bassler, Elmer A., Jr.; and Choby, Edward J., to Westinghouse Electric Corporation. Low parasitic capture fuel assembly structure. 3,791,466, Cl. 176-78.000.

Patton, Bobbie Joe; Prior, Maurice Jack; Sexton, James Howard; and Slover, Vasel Roy, Jr., to Mobil Oil Corporation. Logging-while-drilling tool. 3,792,429, Cl. 340-18.0nc.

Paulson, Donald C., to Litton Industrial Products, Inc. Method for monitoring product quality in a plastics injection-molding machine. 3,792,134, Cl. 264-40.000.

Payne, Delmar V.; and Jaeckle, Wilfried G., to Bendix Corporation, The. Warning indicator to alert aircraft pilot to presence and bearing of other aircraft. 3,792,472, Cl. 343-6.51c.

Payne, John T.: *See—*
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Payson, Buford L., to Roberts Consolidated Industries, Inc., mesne. Extendible tube assembly. 3,791,624, Cl. 254-62.000.

Pearson, Bernard A., to Smith-Williston, Inc. Drill head assembly. 3,791,463, Cl. 173-80.000.

Pearson, Eugene W., to Canron, Inc. Shear machine knife adjustment. 3,791,248, Cl. 83-641.000.

Pebler, Alfred; and Hickam, William M., to Westinghouse Electric Corporation. Method and apparatus for monitoring the total combustibles and oxygen content of gas. 3,791,936, Cl. 204-1.00t.

Pedain, Josef; Arlt, Dieter; and Hagemann, Hermann, to Bayer Aktiengesellschaft. High molecular weight products capable of being cross-linked. 3,792,004, Cl. 260-22.0tn.

Pederson, Richard H.; and Gregory, Robert O., to Monsanto Company. High efficiency transistor AS table multivibrator. 3,792,376, Cl. 331-113.00r.

Pedrosa, Jacobo Valdes: *See—*
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Peerless of America, Incorporated: *See—*
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Peltonen, Lahja Arvid. Lifting carriage on a carrier. 3,791,543, Cl. 214-730.000.

Peluchiwski, John J.; and Walstad, Dennis C., to Furnas Electric Company. Electrical circuit controller. 3,792,402, Cl. 337-59.000.

Pemsel, Ernst R., Jr.: *See—*
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Pena, Joe C.: *See—*
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Pennington, Fred A., to D & P Minerals, Inc. Apparatus for removing samples of particulate materials from an endless belt conveyor. 3,791,218, Cl. 73-423.00r.

Pennington, Keith S.: *See—*
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Pennsylvania Engineering Corporation: *See—*
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Pepper, Lloyd J., to Cambridge Thermionic Corporation. Trimming apparatus for magnetic suspension systems. 3,791,704, Cl. 308-10.000.

Pera, Warren K., to Bell Fold-a-Bike, Inc. Folding bicycle. 3,791,672, Cl. 280-287.000.

Peres, Anthony R., to Peres Electronics, Inc. Film processor. 3,792,487, Cl. 354-299.000.

Peres Electronics, Inc.: *See—*
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Permutit Company Limited, The: *See—*
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Perna, Anthony. Hand cutting tool for gypsum plaster boards or the like. 3,791,014, Cl. 29-294.000.

Perry, Elijah Robert; Cronin, John C.; and Graybill, Howard W., to I-T-E Imperial Corporation. Enclosure for conductor of electrical transmission system. 3,792,191, Cl. 174-84.00r.

Peters, Donald L.: *See—*
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Peterson, William H.; and Rousseau, George L., to Pullman Incorporated. Cushioned underframe arrangement for railway cars. 3,791,532, Cl. 213-8.000.

Petro, James; and Rively, Clair M., to Westinghouse Electric Corporation. Method for making non-tangling beaded filament coils. 3,792,224, Cl. 219-121.01m.

Petro-Electric Motors Ltd.: *See—*
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Petro-Tex Chemical Corporation: *See—*
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Petrolite Corporation: *See—*
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Pett, Alfred W., to New England Union Co. Valve construction. 3,791,619, Cl. 251-45.000.

Pfadenhauer, Dieter: *See—*
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Pfeifer, Josef: *See—*
Wick, Richard; Pfeifer, Josef; and Hofmann, Wilfried, 3,792,483.

Pfeifer, Pius. Flush valve device for toilets. 3,790,968, Cl. 4-38.000.

Pfciffer, Erich A. Device for sensing and warning of excessive ambulation force. 3,791,375, Cl. 128-2.00s.

Pfeiffer, Gerd; Kran, Hans-Peter; and Feldmann, Wilhelm, to Mannesmann Aktiengesellschaft. Skew rolling of solid ingots. 3,791,184, Cl. 72-97.000.

Pfizer Inc.: *See—*
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Pfleiderer, Wolfgang, to Ciba-Geigy Corporation. Pteridine-glycosides. 3,792,036, Cl. 260-211.50r.

Pharr, Robert S.; and Broyden, Robert H., to Ingersoll-Rand Company. Air starter. 3,791,365, Cl. 123-179.00f.

Phelps, Peter M. Cross flow tower fill of cellular construction. 3,791,634, Cl. 261-111.000.

Philipp, Werner; Thomas, Andre; and Fetissuf, Basile, to Etablissements Hutchinson Compagnie Nationale de Caoutchouc. Air mattress. 3,790,975, Cl. 5-349.000.

Philipps, Virgil J., to Everco Industries, Inc. Charging hose assembly. 3,791,406, Cl. 137-515.500.

Phillips, Darryl H., to Ward, Owen M., mesne. Security alarm system with frequency sweeping. 3,792,455, Cl. 340-224.000.

Phillips, David A. Shelf marking punch. 3,791,041, Cl. 33-189.000.

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Cardenas, Carlos G.; and Brady, Donnie G., 3,792,116.
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Phillips, Wendell Gary, to Monsanto Company. Substituted alpha,alpha-dichloro-methane-sulfenyl chlorides. 3,792,088, Cl. 260-543.00h.

Picard, Frank; and Becker, Ludwig, to Sohni & Co. GmbH. Toy and teaching watch, particularly diver-watch. 3,791,048, Cl. 35-39.000.

Picquot, Jean-Pierre. Coin collector receptacle. 3,791,574, Cl. 232-44.000.

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Piere, Benjamin H. Automobile impact absorption apparatus. 3,791,692, Cl. 296-31.00p.

Pierson, John Oliver; White, Roger Douglas; and Brown, Bertram Keith. Long seam machine. 3,791,323, Cl. 112-121.150.

Pietrowian, Mary. Dual face illuminated doll. 3,791,068, Cl. 46-228.000.

Pignato, James M. Water closet. 3,790,967, Cl. 4-28.000.

Piltingsrud, Harley V., to United States of America, Air Force. Isotropic neutron spectrometer. 3,792,280, Cl. 250-390.000.

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Pines, Alexander: *See—*
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Pioneer Electronic Corporation: *See—*
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Plank, David O. Shoring apparatus. 3,791,151, Cl. 61-41.00a.

Plant Industries, Inc.: *See—*
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Plasteco, Inc.: *See—*
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Plasti-Kote Company; a division of Consolidated Foods, Inc.: *See—*
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Plastino, Mario. Head protecting headwear. 3,790,962, Cl. 2-3.00r.

Plate, Walter J., to Anaconda Company, The. Electrical cable. 3,792,192, Cl. 174-102.0sc.

Pliakos, Kostas: *See—*
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Pohlmann, Ulrich R., to Bunker Ramo Corporation. Timepiece escapement. 3,791,251, Cl. 84-116.00r.

Poister, Clarence E.: *See—*
Bendersky, David; and Poister, Clarence E., 3,790,970.

Poitras, Edward J. On-off fire sprinkler. 3,791,450, Cl. 169-37.000.

Polacek, Richard: *See—*
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Polistina, Rocco Alberto: *See—*
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Polydoris, Nicholas G.; and Wollar, Burnell J., to ENM Company. Measuring instrument. 3,791,038, Cl. 33-141.00r.

Ponako, Stephen, to Bendix Corporation, The. Strain relief clamp for an electrical connector. 3,792,417, Cl. 339-103.00m.

Pontarelli, Donald A.: *See—*
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Pontello, Anthony P., to United States of America, Navy. Testing of fuel filters using thermography. 3,791,194, Cl. 73-15.00r.

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Port, Frederick J., to ESB Incorporated. Battery container. 3,791,874, Cl. 136-134.00r.

Porvair Limited: *See—*
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Post, Melvin J.; and Shelter, Kenneth Lee, to Sybron Corporation. Means for mounting a pen drive in a chart recorder or the like. 3,792,496, Cl. 346-145.000.

Potoski, John R.; and Freed, Meier E., to American Home Products Corporation. 3-(1,2,3,4-Tetrahydroisoquinolinomethyl)-3-quinyclidinol. 3,792,053, Cl. 260-288.00r.

Potts, Walter Joseph, to Searle, G. D., & Co. Tranquilizing method employing arachidonic acid. 3,792,179, Cl. 424-318.000.

PPG Industries, Inc.: *See—*
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Pratt, Anthony Michael: *See—*
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Press, Irving D., to Resistoflex Corporation. Positive opening and closing constrictable tube valve with means for prolonging tube life. 3,791,617, Cl. 251-81.000.

Pretz, Floyd H. Paper trimming machine. 3,791,247, Cl. 83-418.000.

Price, Frank D.; and Conners, Richard G., to General Electric Company. Dual bushing capacitor terminal assembly. 3,792,193, Cl. 174-153.00r.

Priel, Ury, to National Semiconductor Corporation. Three-state logic circuit. 3,792,292, Cl. 307-209.000.

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Luedders, Wilmer L.; and Danneman, Douglas L., 3,792,068.

Procter, Brian John; Osborne, Colin Sidney; and Krajewski, Ignacy, to International Computers Limited. Electronic circuit installations. 3,792,285, Cl. 307-38.000.

Proefrock, Paul R., to Dura Corporation. Low cost headlight tester and method. 3,791,740, Cl. 356-121.000.

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Prokat, Bela; and Kanner, Bernard, to Union Carbide Corporation. Preparation of siloxaneoxyalkylene polymers. 3,792,073, Cl. 260-448.80r.

Proudian, Andrew P., to Xonics, Inc. Electron radiographic imaging chamber with current enhancement. 3,792,278, Cl. 250-382.000.

Prusser, Forrest A.; and Everitt, Leroy E. Apparatus for towing skiers. 3,791,469, Cl. 180-6.00r.

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Tamborski, Robert S.; and Raidt, Joe B., 3,791,533.

Purdy, Harold Lawrence, to AMP Incorporated. Binary codable, cam operated, pivoted contact switch assembly. 3,792,206, Cl. 200-6.00b.

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Quirk, Virgil P., to Stackpole Carbon Company. Method of making electrical resistance devices and articles made thereby. 3,791,863, Cl. 117-217.000.

Raat, Terry J., to White Automotive Corporation. Motorcycle rack. 3,791,563, Cl. 224-39.00r.

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Ramachandran, Sundaresan; and Igwe, Basil U. N., to Allegheny Ludlum Industries, Inc. Method for injecting a gaseous reacting agent into a bath of molten metal. 3,791,813, Cl. 75-59.000.

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Ratz, James W., to Honeywell Inc. Shaft speed monitoring circuit. 3,792,460, Cl. 340-271.000.

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Raymond, Gary E. Camming means. 3,791,228, Cl. 74-54.000.

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Regier, Robert B., to Phillips Petroleum Company. Conversion of olefins. 3,792,106, Cl. 260-683.00d.
Reiger, Franz, to Bosch, Robert, G.m.b.H. Solenoid valve for recylcing exhaust gases in internal combustion engine. 3,791,360, Cl. 123-119.00a.
Reinemann, Arthur P., to Allis-Chalmers Corporation. Stationary induction apparatus having sound attenuating core clamping means. 3,792,397, Cl. 336-92.000.
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Rengo Kabushiki Kaisha (Rengo Co., Ltd.): *See—*
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Sawicki, Joseph J., to Bendix Corporation, The. VOR receiver with adaptive filters and phase shifter for improved accuracy. 3,792,473, Cl. 343-106.00r.
Saxholm, Rolf. Supporting element and associated method of use in microbiological, serological, immunological, clinical-chemical and similar laboratory work. 3,791,930, Cl. 195-103.50r.
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Schmitt, Charles R., to United States of America, Atomic Energy Commission. Method for preparing hollow metal oxide microsphere. 3,792,136, Cl. 264-44.000.
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Schrage, Donald J.; and Giery, Edward G., Jr., to Aqua-Chem, Inc. Incinerator. 3,791,317, Cl. 110-8.00r.
Schreiner, Friedrich, to Zahnradfabrik Friedrichafen AG. Vehicle transmission control system for vehicles. 3,791,239, Cl. 74-752.00c.
Schroder, Johann. Fuel composition containing lithium, calcium and fluorocarbon. 3,791,889, Cl. 149-19.300.
Schroeder, Helmuth M. Pop up magnetic door stop and holder. 3,791,687, Cl. 292-251.500.
Schub, Frank J., to Atlantic Richfield Company. Well completion method. 3,791,448, Cl. 166-291.000.
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Schutz, Richard Adrien; and Exbrayat, Pierre Elesee, to Centre Technique Industriel: Institut Textile de France. Process for sizing textile fibres. 3,791,132, Cl. 57-164.000.
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Seiderman, Maurice. Hydrophilic gel polymers of vinyl pyrrolidone and hydroxy alkyl methacrylate. 3,792,028, Cl. 260-80.720.
Seiferi, Franz. Piezoelectric semiconductor devices in which sound energy increases the breakdown voltage and power of capabilities. 3,792,321, Cl. 317-235.00r.
Seleznev, Yury Emelyanovich; and Burkin, Yury Alexandrovich. Device for putting toroidal ferrite core on wire. 3,791,007, Cl. 29-203.0mm.
Self, Kenneth W.; Chew, Norman B.; and Twyman, Bill T., to Freightliner Corporation. Self-leveler. 3,791,664, Cl. 280-124.00f.
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Sharp, Brian William; Warburton, Dennis; and Wooldridge, Kenneth Robert Harry, to May & Baker Limited. Hydrazinecarbodithioate derivatives and metal chelates thereof. 3,792,052, Cl. 260-268.00r.

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Shibamoto, Iwao. Safety device for vehicles such as automobiles. 3,791,666, Cl. 280-150.0ab.

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Sliker, Lawrence S. Photoconductive switching scanner apparatus. 3,792,258, Cl. 250-213.00a.

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Smith, Floyd E. Track escapement and counter. 3,791,555, Cl. 221-198.000.

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Smith, John Edwin Latham; and Witheridge, Philip Henry, to Coal Industry (Patents) Limited. Method and apparatus for detecting pinholes in sheet material. 3,792,458, Cl. 340-259.000.
Smith, Roy E., to Textron, Inc., mesne. Method for securing door frame components. 3,791,017, Cl. 29-432.000.
Smith, Wesley E.; and Horne, Ottis J., Jr., to United States of America, Atomic Energy Commission. Method for increasing the carbon yield of indene-derived carbon precursors. 3,792,155, Cl. 423-448.000.
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Spinner, Georg. Coaxial cables. 3,792,419, Cl. 339-177.00r.
Spinner, Robert E. Data communication system. 3,792,444, Cl. 340-172.500.
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Spransy, Brower C.; Harper, Norman G.; and Steele, Joseph Clayton. Guard for paint applicator. 3,790,984, Cl. 15-248.00a.
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Streich, Georg; and Bauer, Johann, to Siemens Aktiengesellschaft. Arrangement for adjusting the air gap in an electromagnetic switching apparatus. 3,792,393, Cl. 335-273.000.
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Thumm, Helmut; Ruessmann, Gerd; and Kotitschke, Josef. Control arrangement for press grinder. 3,791,596, Cl. 241-34.000.

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Tirone, John C. Means for converting a pull trigger to a release trigger. 3,791,061, Cl. 42-41.000.

Titchenal, Oliver R.; and Armstrong, William A., to Basic Packaging Systems, Inc. Bag construction. 3,791,573, Cl. 229-69.000.

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Wallace, William K., to Chicago Pneumatic Tool Company. Stall torque air shut-off control for pneumatic nut runners. 3,791,458, Cl. 173-12.000.
Walliser, Gerhard, to Daimler-Benz Aktiengesellschaft. Temperature feeler. 3,791,213, Cl. 73-339.00a.
Walstad, Dennis C.: *See—*
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Walter, John; Chambers, Worthy L.; and Stipanuk, John M., to Sunbeam Corporation. Combination ice crusher and drink mixer. 3,791,597, Cl. 241-100.000.
Walter, Wolfgang, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Auxiliary power steering, especially for motor vehicles. 3,791,263, Cl. 92-86.000.
Walters, Ben. Method of making ornamental hollow plastic articles. 3,791,899, Cl. 156-152.000.
Wang, Chen-Shen; and Wennerberg, Arnold N., to Standard Oil Company. Branched polyphenylenes. 3,792,099, Cl. 260-668.00r.
Wanner, William P. Fluid pump. 3,791,768, Cl. 417-393.000.
Warburton, Dennis: *See—*
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Warren, Thornton L. Adjustable pattern water sprinkler system. 3,791,585, Cl. 239-256.000.
Warren, Wesley S., to General Automation Manufacturing Incorporated. Adjustable drill on attachable base. 3,791,755, Cl. 408-76.000.
Wasserman, David; and Levy, Alan J., to Ethicon, Inc. Plasticized polyester sutures. 3,792,010, Cl. 260-32.20r.
Wassermann, Hans. Device for the frictional interconnection of two structural parts. 3,791,498, Cl. 192-57.000.
Watababe, Yoshihachi; and Hirai, Kentaro, to Shionogi & Co., Ltd. 2,4,6-Cycloheptatrien-1-yl dithiocarbamic acid esters. 3,792,074, Cl. 260-455.00a.
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Webb, George, to Avco Corporation. Pressure operated indexing mechanism. 3,791,230, Cl. 74-128.000.
Webb, Richard N., to United States of America, Interior, mesne. Helical multistage flash distillation unit. 3,791,934, Cl. 202-173.000.
Webster, Mild E., to Gillette Company, The. Method of manufacturing a pressurized dispensing package. 3,791,098, Cl. 53-30.000.
Weckbrodt, Ilse. Patterned curtain. 3,791,436, Cl. 160-348.000.
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Young, Bernard W.; deceased (by Young, Sophie; executrix). Surface sweeping machine equipped with gutter brush. 3,790,981, Cl. 15-89.000.

Young, Richard W., to Polaroid Corporation. Projection system employing adjustable mirror for image framing. 3,791,725, Cl. 352-129.000.

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Younkin, James R., to Mitchell Industries, Inc. Aircraft horizon display and steering indicator. 3,792,427, Cl. 340-27.0na.

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Zarenko, Alex, to Saint-Gobain Industries. Electrically heated window. 3,792,232, Cl. 219-522.000.

Zaslavsky, Boris Jurievich: *See—*
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Zdebski, David M. Traffic signaling device for vehicles. 3,791,336, Cl. 116-28.00r.

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Zens, John F., to General Motors Corporation. Occupant restraint system. 3,791,671, Cl. 280-150.0ab.

Ziemek, Gerhard; Beck, August; Gwnia, Ewald; Schatz, Friedrich; and Arntz, Hans-Joachim, to Kabel- und Metallwerke Gutehoffnumgeshutte Aktiengesellschaft. Spacer assembly for concentric tubular systems. 3,791,416, Cl. 138-112.000.

Zietemann, Heinz, to Siemens Aktiengesellschaft. Circuit arrangement for improving the short circuit resistance of the slower interference-free logic circuits. 3,792,291, Cl. 307-239.000.

Zimmerman, Abraham A.: *See—*
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Zirner, Joachim: *See—*
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Zochil, Francesco. Trowelling machine. 3,791,754, Cl. 404-112.000.

Zumeta, Julio; and Case, Edward M., to Marlo Company, Inc., The. Packings for pumps, valves, and the like. 3,791,658, Cl. 277-230.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 12TH DAY OF FEBRUARY, 1974

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bell Telephone Laboratories, Inc.: *See*—
Kakalec, Robert J. Re. 27,916.

Cole, Joseph E., to Scovill Mfg. Co. Popcorn popper having automatic buttering means. Re. 27,920, 2–12–74, Cl. 99—323.8.

Salyer, Ival O.: *See*—
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121.15 3,791,323
138 3,791,324
213 3,791,325

CLASS 113

118R 3,791,326

CLASS 114

16R 3,791,327
42 3,791,328
66.5R 3,791,329
221 3,791,330

CLASS 115

17 3,791,331
27 3,791,332
34R 3,791,333

35 3,791,334
70 3,791,335

CLASS 116

28R 3,791,336
3,791,337
124F 3,791,338
142R 3,791,339

CLASS 117

3.4 3,791,841
16 3,791,842
17.5 3,791,843
33.5CM 3,791,844
33.5T 3,791,845
38 3,791,846
46CG 3,791,847
47A 3,791,340
3,791,848
63 3,791,849
75 3,791,850
93.1PF 3,791,851
93.2 3,791,852
97 3,791,853
136 3,791,854
154 3,791,855
155UA 3,791,856
161KP 3,791,857
201 3,791,858
3,791,859
202 3,791,860
213 3,791,861
3,791,862
217 3,791,863
238 3,791,864

CLASS 118

7 3,791,341
52 3,791,342
60 3,791,343
421 3,791,344
637 3,791,345

CLASS 119

17 3,791,346
19 3,791,347
3,791,348

CLASS 122

11 3,791,349
356 3,791,350
479D 3,791,351

CLASS 123

8.25 3,791,352
8.33 3,791,353
90.12 3,791,354
90.27 3,791,355
117R 3,791,356
3,791,357
3,791,358
119A 3,791,360
119R 3,791,359
139AP 3,791,361
140R 3,791,362
148E 3,791,363
3,791,364
179F 3,791,365
198DB 3,791,366

CLASS 125

11R 3,791,367

CLASS 126

25A 3,791,368
3,791,370
116R 3,791,369
339 3,791,371
390 3,791,372

CLASS 127

32 3,791,865
46A 3,791,866

CLASS 128

1C 3,791,373
1D 3,791,374
2E 3,791,376
2P 3,791,377
2S 3,791,375
2.05M 3,791,378
4 3,791,379
92BB 3,791,380
132D 3,791,381
3,791,382
154 3,791,383
260 3,791,384
263 3,791,385
305 3,791,386
320 3,791,387
335.5 3,791,388

CLASS 130

30D 3,791,389

CLASS 131

196 3,791,390

CLASS 132

39 3,791,391

CLASS 133

1R 3,791,392

CLASS 134

167R 3,791,393
169R 3,791,394

CLASS 136

6R 3,791,867
13 3,791,868
81 3,791,869
86D 3,791,896
86E 3,791,870
100R 3,791,871
120FC 3,791,872
133 3,791,873
134R 3,791,874
173 3,791,875

CLASS 137

13 3,791,395
38 3,791,396
82 3,791,397
116 3,791,399
154 3,791,400
216.2 3,791,401
315 3,791,402
343 3,791,403
433 3,791,404
494 3,791,405
512.15 3,791,407
515.5 3,791,406
529 3,791,408
597 3,791,409
604 3,791,410
614.02 3,791,411
614.11 3,791,412
625.3 3,791,413
625.66 3,791,398

CLASS 138

37 3,791,414
112 3,791,416
127 3,791,415

CLASS 139

11 3,791,417
122W 3,791,418

CLASS 140

92.1 3,791,419
93.2 3,791,420
149 3,791,421

CLASS 141

11 3,791,422
86 3,791,423
92 3,791,424
3,791,425

CLASS 144

2R 3,791,426
3,791,427
172 3,791,428
218 3,791,429
326 3,791,430

CLASS 148

2 3,791,876
6.15Z 3,791,877
6.2 3,791,431
11.5A 3,791,880
11.5F 3,791,878
23 3,791,879
3,791,886
143 3,791,881
172 3,791,887
174 3,791,882
187 3,791,883
3,791,884
3,791,885

CLASS 149

19 3,791,888
3,791,891
3,791,893
19.3 3,791,889
19.4 3,791,892

CLASS 152

339 3,791,432
3,791,433

CLASS 156

60 3,791,894
62 3,791,895
137 3,791,897
143 3,791,898
152 3,791,899
171 3,791,900
172 3,791,901
212 3,791,902
235 3,791,905
245 3,791,906
253 3,791,907
273 3,791,908
306 3,791,909
517 3,791,903
571 3,791,904

CLASS 157

1.24 3,791,434

CLASS 159

25A 3,791,435

CLASS 160

348 3,791,436

CLASS 161

45 3,791,910
58 3,791,911
160 3,791,912
164 3,791,913
190 3,791,914
227 3,791,915
247 3,791,916

CLASS 162

55 3,791,917
343 3,791,918
353 3,791,919
363 3,791,920

CLASS 164

49 3,791,437
55 3,791,438
113 3,791,440
292 3,791,439

CLASS 165

1 3,791,441
45 3,791,443

CLASS 166

.5 3,791,442
54 3,791,444
72 3,791,445
291 3,791,448
307 3,791,446
311 3,791,447
312 3,791,449

CLASS 169

37 3,791,450

CLASS 171

58 3,791,451

CLASS 172

4.5 3,791,452
7 3,791,454
26.5 3,791,455
53 3,791,453
450 3,791,456
781 3,791,457

CLASS 173

12V 3,791,459
12 3,791,458
43 3,791,460
48 3,791,461
80 3,791,463
104 3,791,462

CLASS 174

21C 3,792,187
28 3,792,188
69 3,792,189
72R 3,792,190
84R 3,792,191
102SC 3,792,192
153R 3,792,193

CLASS 175

88 3,791,464
373 3,791,465

CLASS 176

17 3,791,921
20 3,791,922
37 3,791,923
78 3,791,466

CLASS 177

157 3,791,467

CLASS 178

6.8 3,792,194
3,792,195
3,792,196
7.1 3,792,197
7.91 3,792,198

CLASS 179

15BS 3,792,201
15BT 3,792,199
18BC 3,792,202
18GE 3,792,200
90B 3,792,203
110A 3,792,204
175 3,792,205

CLASS 180

1FV 3,791,468
6R 3,791,469
19R 3,791,470
54A 3,791,471
64R 3,791,472
65A 3,791,473
77H 3,791,474
79.2R 3,791,475
91 3,791,476
117 3,791,477
121 3,791,478

CLASS 181

.5BE 3,791,479
.5A 3,791,480
33R 3,791,481
35R 3,791,482
42 3,791,483

CLASS 182

2 3,791,484
106 3,791,485
132 3,791,486
201 3,791,487

CLASS 184

1E 3,791,488
5 3,791,489

CLASS 187

29R 3,791,490

CLASS 188

70R 3,791,491
170 3,791,492
251M 3,791,493
277 3,791,494
322 3,791,495

CLASS 192

22 3,791,496
30V 3,791,497
57 3,791,498
70.27 3,791,499
87.17 3,791,500
93A 3,791,501
111A 3,791,502

CLASS 194

1G 3,791,503
10 3,791,505
71 3,791,506

CLASS 195

29 3,791,924
3,791,925
30 3,791,926
63 3,791,927
66R 3,791,928
103.5R 3,791,929
3,791,930
3,791,931
3,791,932
127 3,791,933

CLASS 198

1 3,791,504
32 3,791,507
34A 3,791,508
41 3,791,509
127R 3,791,510
172 3,791,511
271 3,791,512
288 3,791,513

CLASS 200

6B 3,792,206
35R 3,792,207
48V 3,792,221
51R 3,792,208
61.41 3,792,209
61.45 3,792,211
61.59 3,792,210
68 3,792,212
144B 3,792,213
3,792,214
144C 3,792,215
146R 3,792,216
148B 3,792,217
3,792,218
159R 3,792,219
163 3,792,220
169R 3,792,222

CLASS 202

173 3,791,934

CLASS 203

74 3,791,935

CLASS 204

1R 3,791,937
1T 3,791,936
15 3,791,938
3,791,939
35N 3,791,940
46 3,791,941
56M 3,791,942
56 3,791,943
59AM 3,791,945
59R 3,791,944
82 3,791,946
95 3,791,947
129.75 3,791,948
171 3,791,949
180G 3,791,950
181 3,791,951
192 3,791,952
195S 3,791,953
3,791,954
298 3,791,955

CLASS 206

52F 3,791,514
501 3,791,552

CLASS 208

8 3,791,956
10 3,791,957
15 3,791,958
19 3,791,959
57 3,791,960
65 3,791,961
80 3,791,962
111 3,791,963
120 3,791,964
179 3,791,965
208M 3,791,966
216 3,791,967
251 3,791,968

CLASS 209

73 3,791,515
74R 3,791,517
3,791,518
74 3,791,516
80.5 3,791,519

CLASS 210

23 3,791,969
36 3,791,520
67 3,791,521
198C 3,791,522
3,791,523
217 3,791,525
232 3,791,524
321 3,791,526
387 3,791,527

CLASS 211

88 3,791,528

CLASS 212

124 3,791,529
145 3,791,530

CLASS 213

8 3,791,531
3,791,532
3,791,533
43 3,791,534

CLASS 214

1R 3,791,535
6.5 3,791,537
16.4A 3,791,536
16.6 3,791,538
17C 3,791,539
75R 3,791,540
75T 3,791,541
370 3,791,542
620 3,791,544
730 3,791,543

CLASS 215

274 3,791,545

CLASS 219

98 3,792,223
121LM 3,792,224
131R 3,792,225
147 3,792,226
216 3,792,227
230 3,792,228
284 3,792,229
343 3,792,230
497 3,792,231
522 3,792,232
553 3,792,233

CLASS 220

2.1A 3,791,546
17 3,791,547
20.5 3,791,548
21 3,791,549
23.86 3,791,550
60 3,791,551

CLASS 221

156 3,791,553
289 3,791,554
298 3,791,555

CLASS 222

21 3,791,556
105 3,791,557
161 3,791,558
176 3,791,559
386 3,791,560
396 3,791,561
528 3,791,562

CLASS 224

39R 3,791,563

CLASS 226

19 3,791,564
67 3,791,565
68 3,791,566
112 3,791,567
140 3,791,568

CLASS 228

1 3,791,569

CLASS 229

7 3,791,570
40 3,791,571
69 3,791,572
3,791,573

CLASS 232

44 3,791,574

CLASS 233

19A 3,791,575
19R 3,791,576
21 3,791,577

CLASS 235

61.11E 3,792,234
3,792,235
3,792,236
61.11J 3,792,238
61.11R 3,792,237
61.12N 3,792,239
92CW 3,792,241
92PC 3,792,240
117A 3,792,242
151 3,792,243
151.3 3,792,244
181 3,792,245
186 3,792,246

CLASS 236

54 3,791,578

CLASS 239

3 3,791,579
205 3,791,581
222.17 3,791,582
227 3,791,583
237 3,791,584
256 3,791,585
265.29 3,791,586
267 3,791,587
414 3,791,580
446 3,791,588
453 3,791,589
459 3,791,590
533 3,791,591
666 3,791,592
667 3,791,593

CLASS 240

1EL 3,792,248
2R 3,791,594
7.1 3,792,250
51.11R 3,792,247
106.1 3,792,249

CLASS 241

20 3,791,595
34 3,791,596
100 3,791,597

CLASS 242

47.12 3,791,598
3,791,599
55.19A 3,791,600
55.53 3,791,601
56A 3,791,602
56R 3,791,603
68.3 3,791,604
74 3,791,605
115 3,791,606
184 3,791,607
199 3,791,608
201 3,791,609

CLASS 244

122A 3,791,610
153R 3,791,611

CLASS 248

49 3,791,612
3,791,613
216 3,791,614

CLASS 249

189 3,791,615

CLASS 250

41.3 3,792,251
43.5FL 3,792,252
83.3R 3,792,253
3,792,255
83.6FT 3,792,254
199 3,792,256
211J 3,792,257
213VT 3,792,259
213A 3,792,258
215 3,792,260
219Q 3,792,268
223R 3,792,262
233 3,792,261
272 3,792,269
311 3,792,263
3,792,264
315 3,792,265
318 3,792,266
322 3,792,267
336 3,792,270
338 3,792,275
343 3,792,272
347 3,792,271
366 3,792,273
368 3,792,274
369 3,792,276
3,792,277
382 3,792,278
384 3,792,279
390 3,792,280
444 3,792,281
459 3,792,282
468 3,792,283
551 3,792,284

CLASS 251

1 3,791,616
8 3,791,617
37 3,791,618
45 3,791,619
65 3,791,620
122 3,791,621

CLASS 252

12 3,791,970
32.7R 3,791,985
33.4 3,791,971
37.7 3,791,972

41 3,791,973
49.5 3,791,974
3,791,975
75 3,791,976
156 3,791,977
180 3,791,978
187 3,791,979
188.3R 3,791,980
301.1R 3,791,982
301.1W 3,791,981
305 3,791,983
308 3,791,984
316 3,791,987
355 3,791,986
408 3,791,988
413 3,791,989
421 3,791,994
427 3,791,990
447 3,791,991
463 3,791,992
466J 3,791,993
471 3,791,995

CLASS 254

51 3,791,623
62 3,791,624
138 3,791,625
150R 3,791,626
168 3,791,627
172 3,791,628

CLASS 259

1R 3,791,629
4 3,791,630
8 3,791,631

CLASS 260

2.1E 3,791,996
2.5AB 3,792,001
2.5AY 3,791,997
2.5BD Re.27,917
2.5M 3,791,999
2.5S 3,791,998
3.5 3,792,000
18TN 3,792,003
18N 3,792,002
22TN 3,792,004
27BB 3,792,005
29.6NR 3,792,006
29.7P 3,792,007
30.6SB 3,792,008
31.4R 3,792,009
32.2 3,792,010
33.6SB 3,792,111
37EP 3,792,011
37SB 3,792,012
45.75R 3,792,013
45.85B 3,792,014
45.95H 3,792,015
47CP 3,792,019
47EN 3,792,016
3,792,018
47R 3,792,017
61 3,791,890
65 3,792,020
73R 3,792,021
3,792,027
77.5AM 3,792,022
77.5AQ 3,792,023
78TF 3,792,024
78.5T 3,792,025
79.3A 3,792,026
80.72 3,792,028
88.2C 3,792,029
91.1R 3,792,030
94.7N 3,792,031
112.5 3,792,032
3,792,033
3,792,034
210AB 3,792,035
210R 3,792,037
210.5 3,792,038
211.5R 3,792,036
3,792,039
3,792,040
234R 3,792,041
239D 3,792,042
239.3A 3,792,045
239.55D 3,792,043
239.55R 3,792,046
243C 3,792,047
247.2R 3,792,048
249.6 3,792,049
251A 3,792,050
256.4N 3,792,051
268R 3,792,052
288R 3,792,053
293.64 3,792,054
295AM 3,792,055
307D 3,792,056
309 3,792,057
326N 3,792,061
332.1 3,792,060
340.7 3,792,062
345.2 3,792,063
345.7 3,792,058
3,792,064
370 3,792,065
405 3,792,066
409 3,792,067
429.3 3,792,068
429.7 3,792,059
431 3,792,069
448R 3,792,070
448.2E 3,792,072
448.8R 3,792,071
3,792,073
455A 3,792,074
463 3,792,075
465.4 3,792,076
467 3,792,077
468H 3,792,079
468R 3,792,078
471A 3,792,080
472 3,792,081
473G 3,792,082
501.2 3,792,083
502.5 3,792,084
514R 3,792,085
533N 3,792,086
533R 3,792,087
543H 3,792,088
553A 3,792,089
571 3,792,090
577 3,792,091
583H 3,792,092
607A 3,792,093
3,792,095
609R 3,792,094
612R 3,792,096
666PY 3,792,097
668A 3,792,098
3,792,100
668R 3,792,099
677R 3,792,101
680E 3,792,103
680R 3,792,102
681 3,792,104
681.5R 3,792,105
683D 3,792,106
3,792,107
3,792,108
683.2 3,792,109
683.3 3,792,110
834 3,792,112
857UN 3,792,113
858 3,792,114
860 3,792,115
861 3,792,116
864 3,792,117
873 3,792,118
874 3,792,119
3,792,120
3,792,121
876B 3,792,124
876R 3,792,122
3,792,123
3,792,125
880B 3,792,127
880R 3,792,126
890 3,792,128
927R 3,792,129
944 3,792,130
961 3,792,131

CLASS 261

35 3,791,632
101 3,791,633
111 3,791,634

CLASS 264

33 3,792,133
40 3,792,134
41 3,792,135
44 3,792,136
45 3,792,137
46 3,792,138
47 3,792,141
58 3,792,139
65 3,792,142
94 3,792,143
96 3,792,144
98 3,792,140
100 3,792,145
205 3,792,146
225 3,792,147
331 3,792,148
336 3,792,149

CLASS 266

3R 3,791,635
13 3,791,636
3,791,637
38 3,791,638

CLASS 267

155 3,791,639

CLASS 269

136 3,791,640

CLASS 270

31 3,791,641

CLASS 271

80 3,791,644
204 3,791,643
236 3,791,642

CLASS 272

57B 3,791,645
71 3,791,646

CLASS 273

79 3,791,647
131AB 3,791,648
131AD 3,791,649
138A 3,791,650
150 3,791,651
162D 3,791,652
185R 3,791,653
186A 3,791,654
218 3,791,655

CLASS 274

17 3,791,656

CLASS 277

53 3,791,657
230 3,791,658

CLASS 279

2 3,791,659
20 3,791,660
43 3,791,661

CLASS 280

1.1 3,791,662
11.35N 3,791,663
11.35T 3,791,675
124F 3,791,664
150AB 3,791,666
3,791,667
3,791,669
3,791,670
3,791,671
150C 3,791,668
150R 3,791,665
287 3,791,672
411A 3,791,673
433 3,791,674
475 3,791,676

CLASS 281

46 3,791,677

CLASS 285

110 3,791,678
155 3,791,679
174 3,791,680
233 3,791,681

CLASS 290

2 3,791,682
38 3,791,684
3,791,685

CLASS 292

32 3,791,683
216 3,791,686
251.5 3,791,687
283 3,791,688

CLASS 294

1CA 3,791,689
71 3,791,690

CLASS 296

28A 3,791,691
31P 3,791,692
146 3,791,693

CLASS 297

250 3,791,694

CLASS 298

22J 3,791,695

CLASS 299

10 3,791,696
14 3,791,697
23 3,791,698
37 3,791,699

CLASS 301

37CM 3,791,700

CLASS 303

21BE 3,791,701
3,791,702

CLASS 307

38 3,792,285
58 3,792,286
66 3,792,314
88.3 3,792,287
102 3,792,288
125 3,792,289
209 3,792,292
233 3,792,290
239 3,792,291

CLASS 308

9 3,791,703
10 3,791,704
15 3,791,705
216 3,791,706

CLASS 310

5 3,792,293
9.5 3,792,294
46 3,792,295
166 3,792,296
183 3,792,297
242 3,792,298
258 3,792,299

CLASS 312

111 3,791,707
221 3,791,708
245 3,791,709

CLASS 313

85R 3,792,300
188 3,792,301

CLASS 315

3.6 3,792,302
17 3,792,303
18 3,792,304
27XY 3,792,305
39.57 3,792,306
77 3,792,307
150 3,792,308
169TV 3,792,311
200A 3,792,309
257 3,792,310

CLASS 316

17 3,791,710
20 3,791,711

CLASS 317

2F 3,792,312
11A Re.27,919
27R 3,792,313
31 3,792,316
112 3,792,315
157 3,792,317
234R 3,792,318
235R 3,792,319
3,792,320
3,792,321
3,792,322
260 3,792,323

CLASS 318

79 3,792,325
138 3,792,326
139 3,792,327
3,792,328
210 3,792,329
221E 3,792,324
269 3,792,330
482 3,792,331
562 3,792,332
571 3,792,333
579 3,792,334
685 3,792,335
696 3,792,336

CLASS 321

2 3,792,337
8C 3,792,338
18 3,792,339

CLASS 322

7 3,792,340

CLASS 323

22T 3,792,341
61 Re.27,916
68 3,792,342
82 3,792,343

CLASS 324

.5R 3,792,345
3,792,346
30R 3,792,347
34ST 3,792,348
51 3,792,349
52 3,792,350
77D 3,792,344
81 3,792,351
99D 3,792,352
137 3,792,353
178 3,792,354

CLASS 325

42 3,792,355
3,792,356
46 3,792,357
128 3,792,358
319 3,792,359

CLASS 328

14 3,792,360
63 3,792,361
72 3,792,362
164 3,792,363

CLASS 329

50 3,792,364

CLASS 330

15 3,792,365
22 3,792,366
98 3,792,367

CLASS 331

3 3,792,368
71 3,792,369
94.5 3,792,370
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393	3,791,768		CLASS 418	311	3,792,152		3,792,161	337	3,792,167	152	3,792,174
417	3,791,769	15	3,791,778	319	3,792,153	180	3,792,164		CLASS 425	157	3,792,176
418	3,791,770	30	3,791,779	390	3,792,154	215	3,792,165	82	3,791,783	178	3,792,177
	3,791,771	60	3,791,780	448	3,792,155	216	3,792,162	132	3,791,784	187	3,792,178
423A	3,791,772	179	3,791,781	580	3,792,156	229	3,792,163		CLASS 426	250	3,792,182
	3,791,774	236	3,791,782		CLASS 424	270	3,792,166	38	3,792,171	307	3,792,183
423	3,791,773		CLASS 423	35	3,792,157	300	3,792,168	72	3,792,172	364	3,792,175
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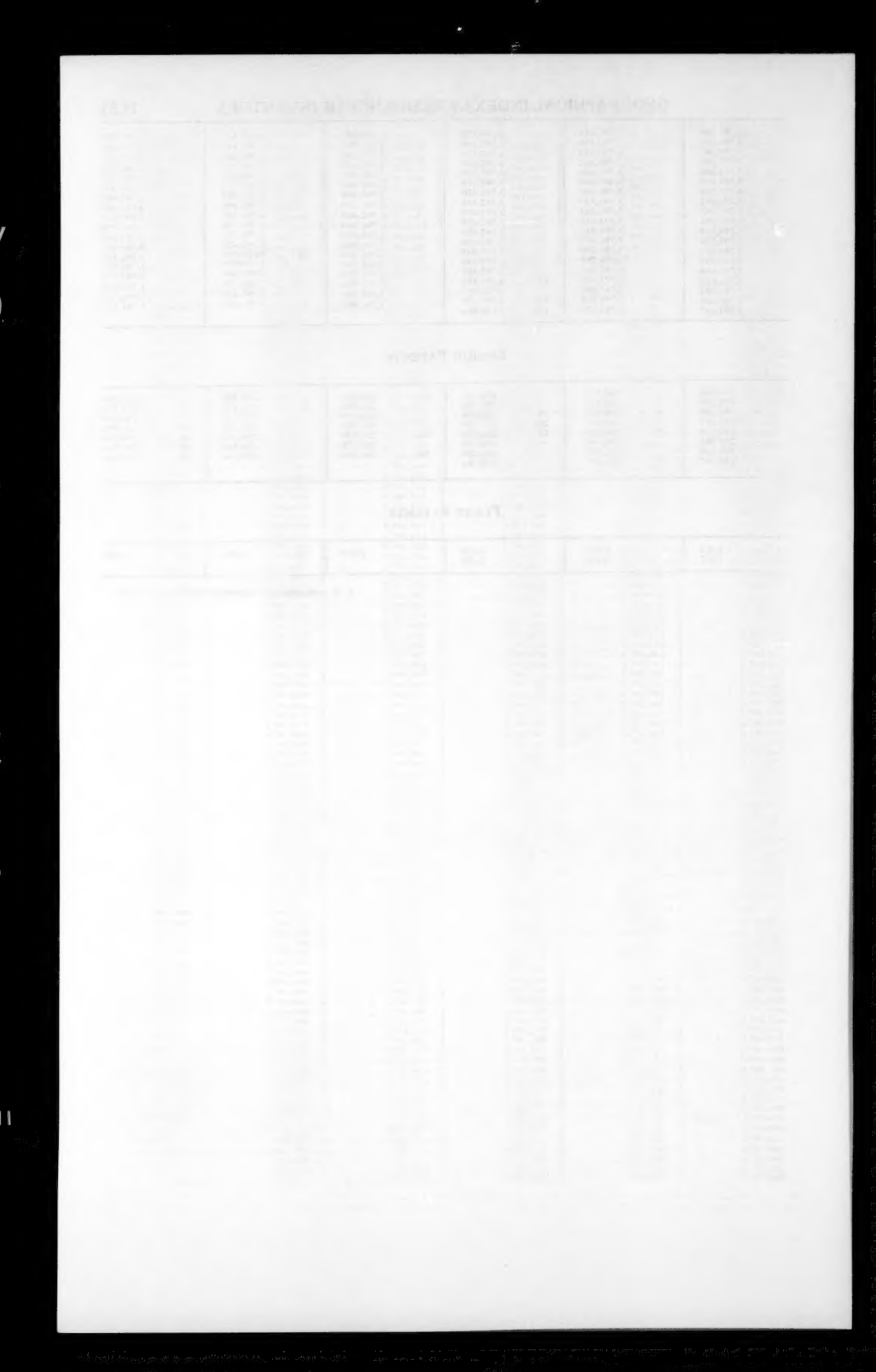

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Frederick B. Dent, *Secretary*